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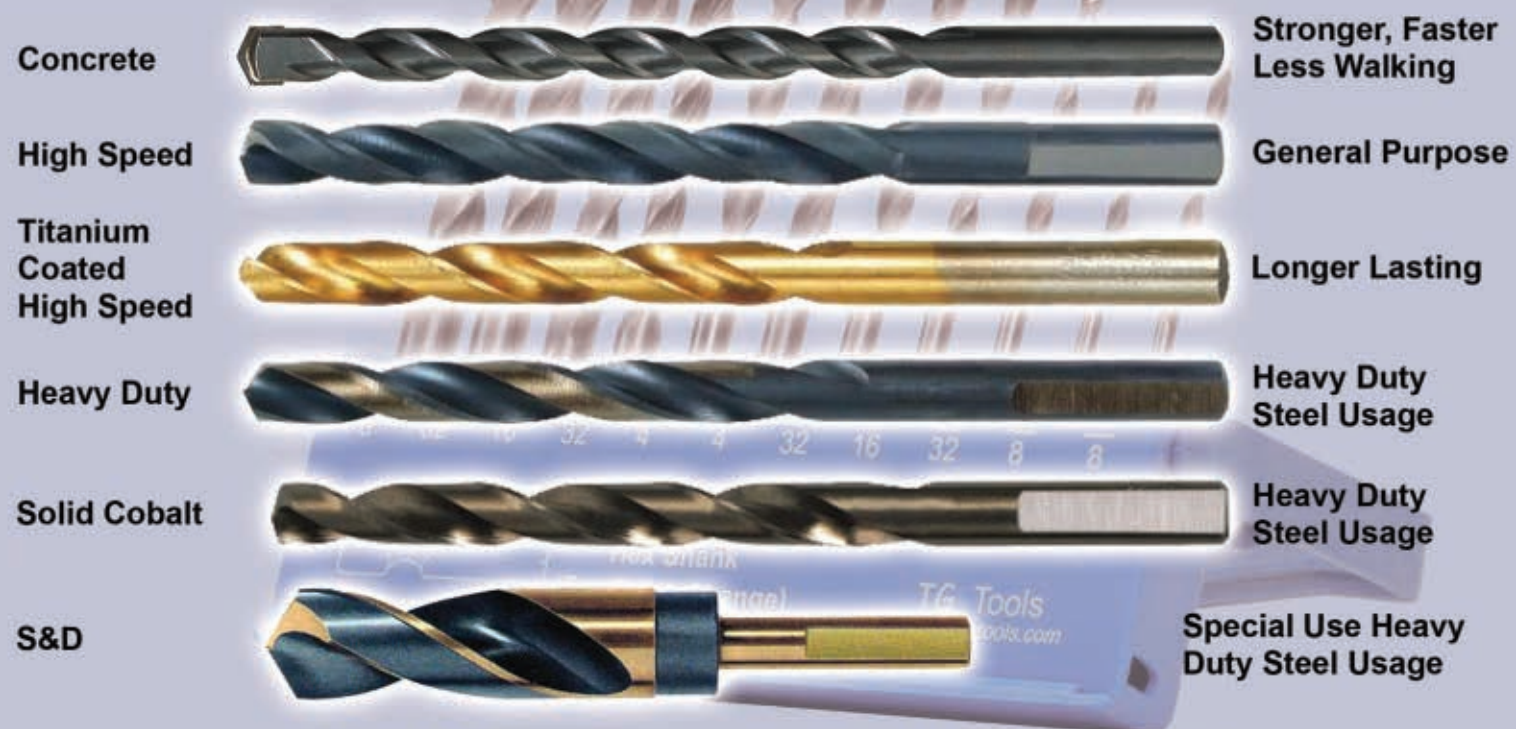


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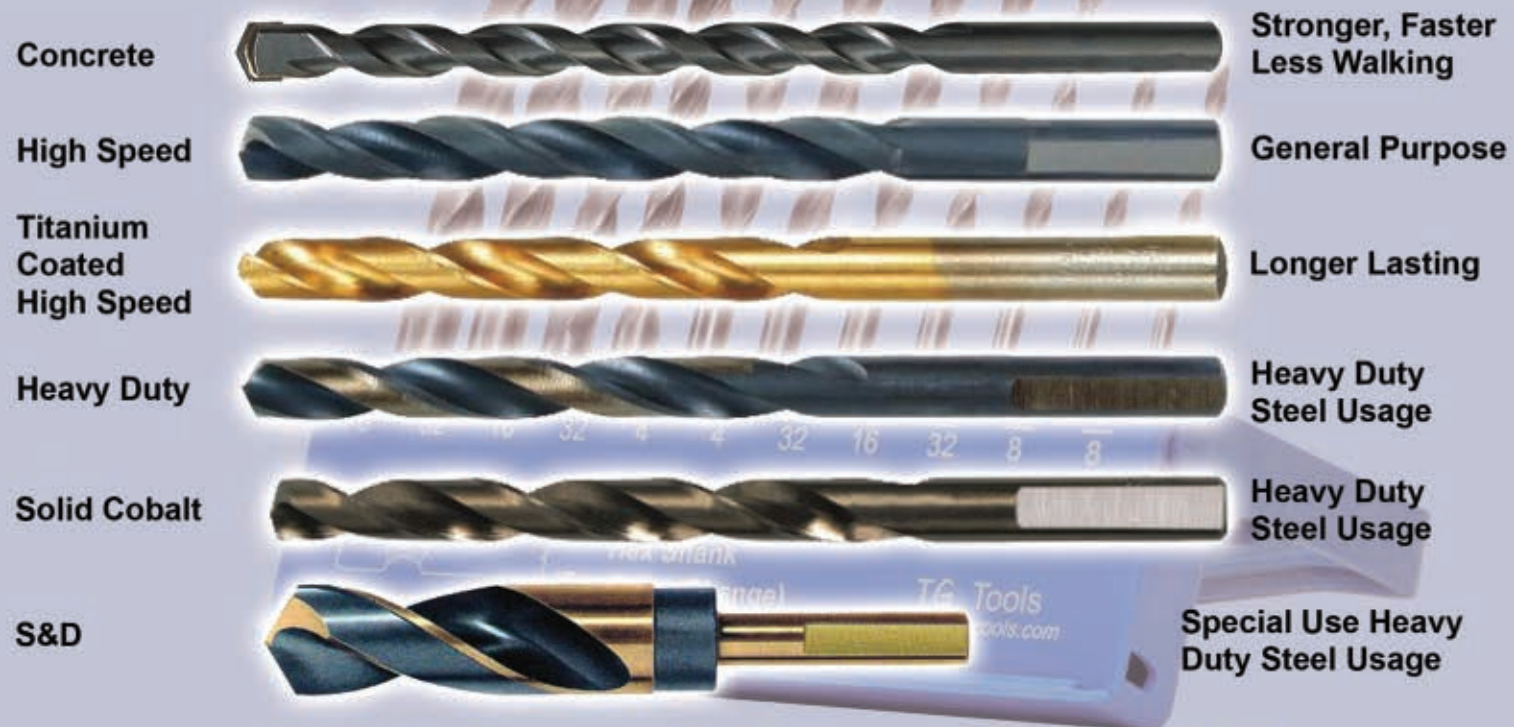


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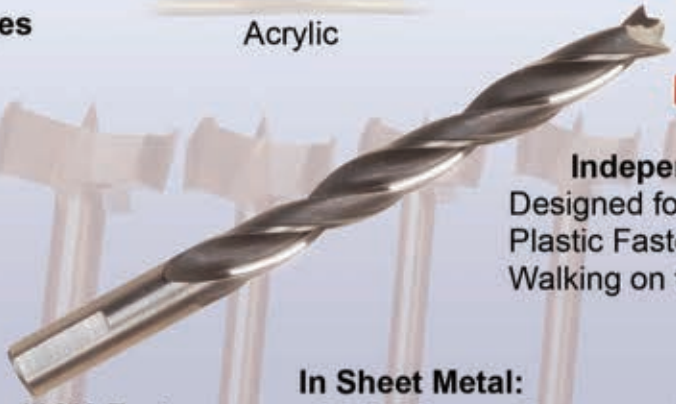

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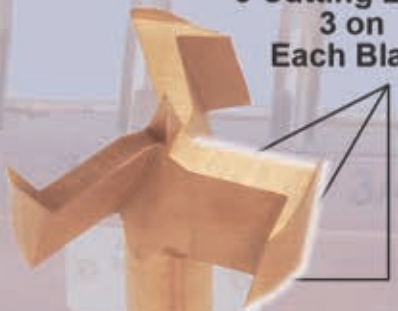

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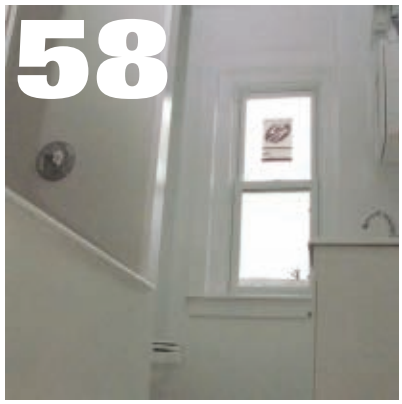


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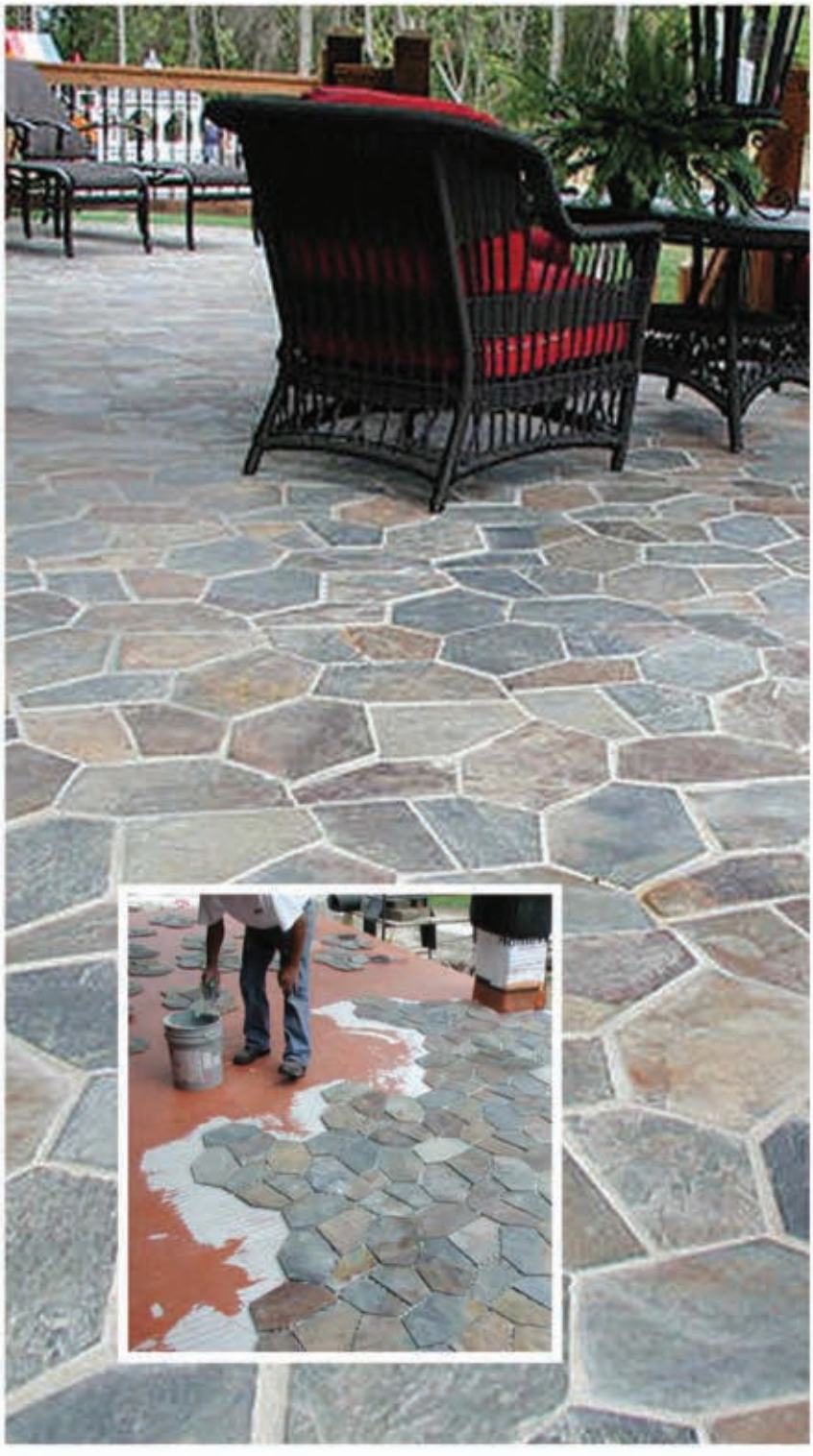

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# LETTER *From The Editor-In-Chief*

If you're a regular reader of this magazine then you're aware that I write a lot of how-to stories. The truth is that I read two or three times as many as I write, from books covering everything from home repair to lawn care. And, sometimes those how-to stories can be a real lifesaver in a sticky situation.

For instance, just a couple of days prior to typing this editor's note I was driving to work when steam started wafting from beneath the hood of my pickup. My engine temp gauge started spiking into the red at the same time. I was forced to pull over to a gas station or burn the engine. I called my wife to the rescue. Once she arrived with our second vehicle, she graciously poured water into my truck while I lay on the ground and watched it stream out the side of the radiator, which had evidently ruptured.

I commandeered her car, dropped her back at work and zipped to a radiator shop across town after verifying there was a replacement part in stock. Next thing you know I'm back at the gas station with a toolbox, covered from head to toe in grease, pulling out a bad radiator and installing a new one on the spot.

Now, I had never replaced a radiator, nor did I have a truly solid grasp of exactly how they operate—one reason you're not likely to see me author any automotive stories. What I did have going for me was a Haynes Repair Manual, which is basically a step-by-step repair guide specific to vehicle makes and models. For all practical purposes, mine could have been titled "How to Work on a '99 Dodge Dakota." I keep a different version in my wife's car that relates to her model.

To make a long story short, I got the job done. With the right tools, a good how-to book and some sage advice from my dad via a cell phone (he has probably forgotten more about automotive engineering in his lifetime than I'll ever learn), I made my first and hopefully only radiator replacement all by my lonesome, while parked at a gas station in an area of town that I would normally avoid at all costs.

And, I've got to admit, I took pride in solving the problem without running to someone else to fix it for me. Sure, I saved money I would have otherwise spent on a mechanic, but the satisfaction I get from doing my own repairs goes deeper than saving money. It's about self-reliance, which I fear is a fleeting value in today's society. I only hope that somewhere along the way an *Extreme How-To* story can help you help yourself, in the same way they help me.

Extreme How-To

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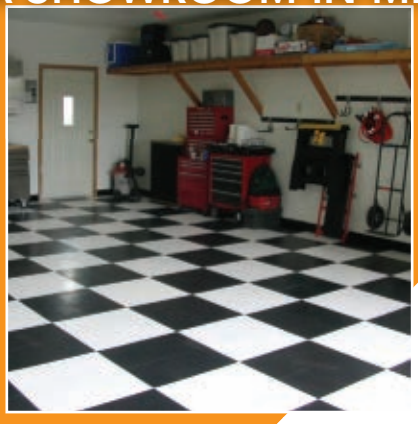
## MAKE YOUR GARAGE INTO A SHOWROOM IN MINUTES



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**Q:** *We installed a new carpet with a thicker pile than the old. Now we have a bi-fold door that sticks against the carpet. What's the easiest way to fix this?*

**A:** First, use the pivot adjustment at the bottom of the door so the bottom clears the carpet. However, usually you will have to cut the door. With the door slightly opened, measure up 1/2 inch from the highest point on the carpet and mark the door. Then open the door completely and remove it from the brackets. Lay the door flat on a work table and mark the cutline on the rear side of the door. Clamp a cutting guide to the door, or use a very straight board as a makeshift guide, situated so the blade is aligned slightly to the outside of the line. Make the cut, and then round off the sharp cut edges of the door with sandpaper. Then replace the door and you should have ample clearance.

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**Q:** *I'm building a double-door gate for wood fence. How do I construct it so it doesn't sag?*

**A:** First, use the biggest, beefiest hinge hardware you can find. Second, build the gate doors with ample bracing. For large doors, skip the "Z" shaped bracing in favor of a "double Z" for each door. In other words, each door should utilize three 2-by-4 cross braces perpendicular to the fencing and two diagonal braces connecting them, with the fence boards driven into each brace they cross. Correctly constructing your support posts is also critical. You'll get more stability from 6-by-6 posts rather than 4-by-4's. Each post should be anchored with a concrete footing and be buried in the ground a third of its height. Plus, at the base of the two posts, install a horizontal post flush between the two, or use a poured bridge of concrete, to prevent the posts from pulling towards each other at the bottom, due to the weight of the gate doors.

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*Questions About Home Building, Remodeling? Have Your Own How-To Tip? Visit our website at* ***www.extremehowto.com*** *and click on Home Repair Forum.*

**Q:** *I have a water stain on my hardwood floor from a leaky plant. Is there a way to remove this?*

**A:** Try using a vibrating palm sander with progressively finer grits. Try 100-grit first, move to 150-grit, and so forth until you achieve the desired smoothness. After removing the dust you'll need to match the stain to the rest of floor. Use a bare piece of wood the same species as the flooring to test your stain. It may help to mix and match stains to get the right look. You want to assess the stain while it is wet, not dry, because the wet stain will better reflect what the final finish will look like after it's been coated with polyurethane.

**Q:** *How do I repair a sagging floor?*

**A:** Sagging or sloping floors are often due to support beams that are deflecting or failing. Rotted sill plates or a weak foundation can also cause floors to sag. You can sometimes correct minor sags on the first floor using a pair of screw-type jack posts and a wood or steel beam to bridge the jacks. To do so, the posts need a very solid foundation to support them, such as a concrete pier for the jack that's about 24 inches square and at least 12 inches deep poured over an existing concrete foundation. Once the concrete has cured and the jacks are in position, slowly raise the floor, as little as a quarter turn per week. Raising the jack in such gradual increments allows the structure to settle with minimal stress or damage to the building. However, keep in mind that lifting the floor—even slowly—might create cracks in the walls and alter the margins around windows and doors, requiring additional repair. Sagging beams caused by rot, water or insect damage should be inspected by a professional contractor. **EHT**

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# Cordless Tool Update

## Break the leash of a power cord with these innovative battery-powered tools.

By Matt Weber

### DEWALT 18V XRP COMBO DRILL

If you're looking for a top-of-the-line drill, you'll find it with the new DeWalt DCD970KL, which is the heavyweight of the company's new XRP line. DeWalt manufactures heavy-duty drills with solid construction to withstand the rigors of everyday usage on the professional job site. The new 18-volt hammerdrill/drill/driver (DCD970KL) features a Nano-Phosphate Lithium-Ion battery that is backwards compatible with more than 40 tools in the DeWalt 18-volt system. It also boasts the smallest length and height in its tool class, which is great for work in tight spaces.

One of the DCD970KL's patented features is a three-speed transmission to match power and speed to the application at hand. The first speed is ideal for drilling large holes in wood with large-diameter hole saws and self-feed bits. The second speed is ideal for use with auger bits and step bits, while the third speed is used for fastening and hammer drilling into concrete. The speed shifting control is now positioned front to back and has positive detent stops for easy shifting between various speeds. All XRP drills are built with a brand new high-efficiency frameless motor that delivers increased performance for drilling and fastening applications. The combination of the new motor and patented three-speed transmission provides 30 percent more run time than previous XRP drills. Plus, the hammerdrills are equipped with an exclusive chuck that self-tightens to prevent bits from slipping, providing twice the bit-holding strength of a traditional ratcheting chuck. (www.dewalt.com)

### CRAFTSMAN HAMMERHEAD AUTO HAMMER

Craftsman offers a cordless innovation on what has traditionally been a pneumatic tool—the automatic hammer. The new Hammerhead Auto Hammer is a compact, 12-volt automatic hammer powered by a rechargeable lithium-ion battery. The first tool of its kind on the market, it offers trigger-activated hammering action to drive nails up to 3-1/2 inches long. Will this tool ever replace the hammer? No, and that's not its purpose, unless the user has some sort

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of physical malady to prevent normal swinging of a standard hammer. Rather, it's small size and weight of less than 2 pounds best suits it for those tricky jobs in tight places, where confined work areas leave no clearance for a normal hammer strike. The Hammerhead's high speed/high torque design drives nails quickly and with little effort in lumber to finished wood. You can, however, expect a good bit of noise from the tool's 3,600 impacts per minute.

The *EHT* staff tested this tool on a recent fence construction project. We were toe-nailing the fence rails, and whenever a nail gun left those toe-nails proud, the Hammerhead easily knocked them down flush with the framing without marring the wood surface from wayward hammer blows. Additionally, the fence we were erecting stood less than a foot away from the next-door neighbor's preexisting fence. When there was no room for swinging a hammer or using a nail gun to nail up the boards, the compact Hammerhead did the trick. It features a magnetic head to hold nails while you drive them, and the tool's retractable nail sleeve keeps the nail pointed straight to eliminate bends. Although the Hammerhead is somewhat of a niche-oriented tool, it's nice to have when you're in that niche. (www.sears.com/craftsman)

## SKIL iXO3

After the stunning success of Skil's first-generation iXO palm-sized screwdriver, which sold more than a million units in its first year on the market, you can expect the company to continue upgrading a good thing. The new iXO3 cordless screwdriver is more versatile thanks to the addition of two new attachments. Sold in a kit, the new

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iX03 contains a right-angle attachment, allowing users to get into even more tight spaces and awkward angles. The right-angle feature is ideal for assembling cabinets, minor plumbing repairs, or anywhere else that requires you to work in hard-to-reach places.

Also available is the precision clutch attachment, designed to make stripping screws and driving too deep a thing of the past. Sold separately as an accessory, the clutch attachment delivers more control when driving into softer woods or metals, which is perfect for such tasks as assembling electronics or building models. A great tool for light-duty chores around the house, the iX03 includes a built-in work light to illuminate project areas, a fully removable 10-piece bit set and a magnetized 1/4-inch hex chuck. With its lithium-ion technology, the tool's integrated battery can hold its charge for up to 18 months so it's always ready for an unexpected repair. (www.skil.com)

## DREMEL 10.8V LITHIUM-ION

Every Christmas my extended family plays a "takeaway gift" game in which someone brings

a Dremel, and it invariably becomes a hot item to "steal" from a family member. Dremel rotary tools are exceptionally versatile for home-improvement work, woodworking, metalwork, crafts, model making and more. The new lithium-ion, 10.8-volt Dremel Model 800 now cuts the cord while retaining the power of a corded tool (variable speed of 5,000 to 35,000 rpm—the same as a corded Dremel). The kit comes with a hard case, charger and 40 accessories, although there are plenty more for a vast array of applications.

In addition to the new 10.8-volt battery pack, the tool also keeps many of the popular features as its predecessor, including a soft grip handle, battery release button, collet, collet lock button and a power switch/speed control dial. Without the cord, the new Dremel can be used in remote places away from an outlet, and its compact, ergonomic design makes it nearly as easy to hold and use as a large Sharpie. A Dremel is an ideal gift or purchase for the do-it-yourselfer who tackles projects ranging from removing grout and cutting through drywall to detailed sanding and tool sharpening. (www.dremel.com)

## BOSCH PS50 MULTI-X

The Bosch PS50 Multi-X has made several jobs easier for me over the last couple of months. Regular readers may have seen this new 12-volt lithium-ion oscillating tool pop up in some recent stories where our staff used its jab-saw attachment to notch a countertop, and used the same blade to notch out some door casing to install transition molding from one floor surface to another. In the past I used a hammer and chisel for such operations, and it took me a heck of a lot longer to accomplish the same cuts. I've also used the flush-cut attachment of the Multi-X to cut a few door jambs to make room for new

## NO SKATING!

**During the course of this cordless tool review, we also tested a new drill bit design from Century Drill & Tool Corp. The new 13-piece Charger bit set features advanced helix geometry. Manufactured from high-speed steel, the new design begins with a 135-degree Quick-cut Point. Whereas the most common point angle for drill bits is 118 degrees, that shallow angle too often means the user must first dimple the work surface in tough materials such as metal, so the bit doesn't "skate" or "wander" during drilling. That's an extra step that the Quick-cut Point eliminates with its sharp, self-feeding tip. Additionally, the deep flute design allows fast chip removal, which reduces heat and wearing of the bit for longer life. Plus, the heavy-duty, industrial webbing adds extra stability and strength for precise holes in even the hardest materials. Ranging in size from 1/16 to 1/4 inches, the new Charger bit set from Century Drill provides high-quality drilling in wood, plastic and metal. Visit www.centurydrill.com.**

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flooring—a great feature that eliminated the need to purchase or rent a dedicated jamb saw.

I love this tool, but some of my home-improvement colleagues have voiced complaint that the battery runtime is too short to optimize the tool's accessory sanding attachments. This may be the case, but with such a small abrasive footprint I wouldn't grab this tool for anything other than occasional light-duty detail sanding, otherwise I'm grabbing a dedicated corded sander. For my money, the advantages of the PS50 Multi-X lies in its cordless cutting versatility, which saves time, hassle and the need to invest in multiple tools since this one will do multiple jobs. The new line of Bosch accessories for the PS50 includes blades for plunge cutting in wood or metal, flush-cut blades, grout removal wheels, and pads for sanding or polishing applications. Remove tile mortar, remove caulk, cut nails, cut pipe—you name it, the Multi-X will probably do it. (www.boschtools.com)

## SKIL ROTARY CUTTER

From cutting the ubiquitous plastic that is used to package every product from Barbie dolls to drill bit indexes, to cutting materials as thick as carpet, the Skil Rotary Cutter takes frustrating tasks and makes them a cinch. The *EHT* staff has used the Rotary Cutter since its release and found it to be one of the most useful tools around the house.

Although a 3.6-volt tool doesn't sound impressive, the Power Cutter handles jobs much larger than we expected. While removing water-damaged carpet, we used


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the cutter to remove a section of the molded material without removing the king size bed that covered the carpet seam. In a kitchen makeover, the Rotary Cutter cut through sheets of Plexiglas without tearing the fragile material.

However, a favorite use is cutting through the plastic packaging during holidays and birthdays. Have you ever used a knife to try and open those clamshell toy packages only to end up donating blood, or cutting a wire that was hidden by the cardboard? With the Skil Rotary Cutter, you simply feed the plastic into the self-sharpening blade that is protected by a metal guard and cut the edges off, clean and simple. (www.skil.com)

## HITACHI MICRO IMPACT DRIVER

Hitachi's new WH10DFL 12-volt peak lithium-ion Micro Impact Driver weighs a mere 2.2 pounds, is less than 6 inches long and fits easily into a pants pocket. But don't let its small size fool you. With 840 inch-pounds of turning torque (more than any cordless drill/driver), this little beast can sink fasteners in a world of applications. Since receiving a test model a few months ago, the *EHT* staff has used it to assemble cabinets, construct furniture, frame decks and install gutters (see gutter story,

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page 48). In fact, while building a fence gate the day before typing this review, I used the WH10DFL to sink a 5-inch LedgerLok lag screw into 6 inches of treated Southern Pine without predrilling. Talk about a lot of power in a tiny package. As the resistance of the load increases, the impact action engages to greatly increase torque to power through the toughest jobs. The Micro Impact Driver includes a quick-change, 1/4-inch hex chuck for simple bit replacements, as well as a handy LED work light.

Additionally, Hitachi now backs up the WH10DFL as well as the rest of the HXP lithium-ion line with an exclusive 10-year warranty to the original purchaser. This industry-leading warranty is retroactive and applies to Hitachi's lithium-ion tools purchased since their initial launch back in August of 2006. Hitachi customers who purchased applicable cordless lithium-ion tools before this warranty announcement will automatically be covered. (www.hitachipowertools.com)

## ROCKWELL CORDLESS DRILLS

Rockwell Power Tools offers a new line of 18-volt lithium-ion portable power tools to balance compact design, light weight, high torque, fast charge time—and something unprecedented with cordless tools: free battery replacement for life. The free battery-replacement program corresponds to the new Rockwell product lines, including the LithiumTech 18-volt lithium-ion tools and Rockwells' ComPack NiCad product line. (www.rockwelltools.com) EHT

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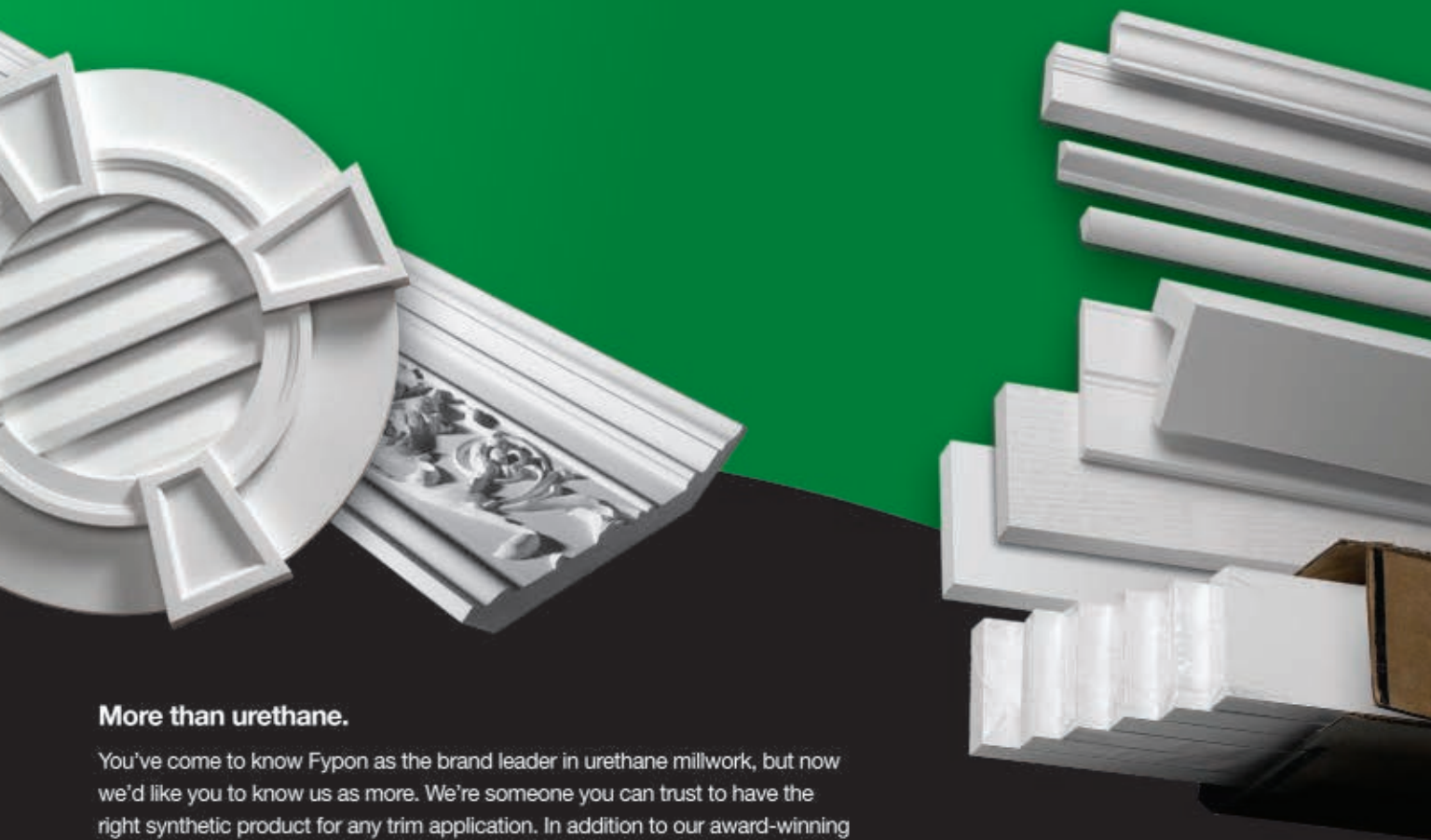

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# BUILDING A

**By Mark Clement**

It depends who you talk to: I've heard them referred to as pergolas, arbors, colonnades, a trellis, and (no joke) "one of those garden thingies."

Whatever they're called, I enjoy building them. I like the balance of macro work (digging holes, cutting timbers) and micro work (awesome layout tricks, scroll cuts). There's just enough of each to tickle my carpenter's ganglia without sending me to Bedlam.

What's more, after having built several of them I can tell you the ROI (return on investment) is awesome. A nice pergola creates a look and a space that enhances a backyard experience—even when you're not eating dinner or playing with the kids beneath it. You can see them out the window, when walking in from the driveway, or as you mow the lawn. And while the pergola explained here is built as a stand-alone, weaving one into an existing patio or sitting area is also ideal. (See Sidebar, "Making the Connections".) Then of course, there's the outdoor living aspect: There is nothing like kicking back on a lazy summer evening under a pergola, dining al fresco, and spending time with family and friends. And, if you can safely weave in an outdoor fireplace situation—man, there's a lot to love.

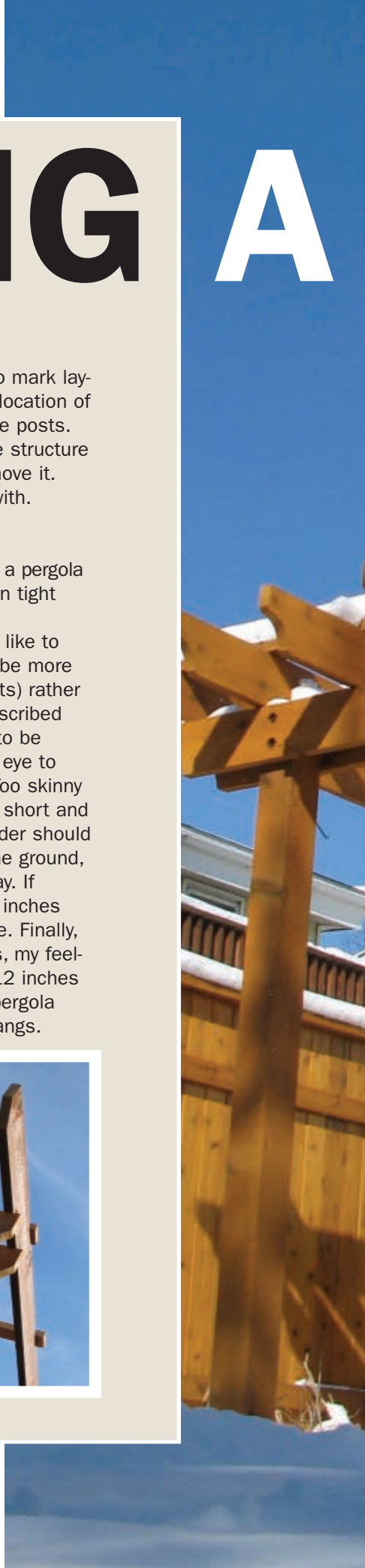
If you're a builder or remodeler, building pergolas is typically pretty profitable. A pergola is practically the definition of a luxury item, and budgets usually enable me to use nice materials and take the time required to build them well. It's a nice departure from razor-thin margins and brain-surgery retrofits.

A key element to building this kind of project as a freestanding unit is full-size templating. The template is what I call a "sandbox." It's great. I use it to mark layout, confirm proper sizing and location of the structure, and to anchor the posts. When it comes time to trim the structure I can leave the sandbox or remove it. And, there's no string to fuss with.

## DEFINING DESIGN

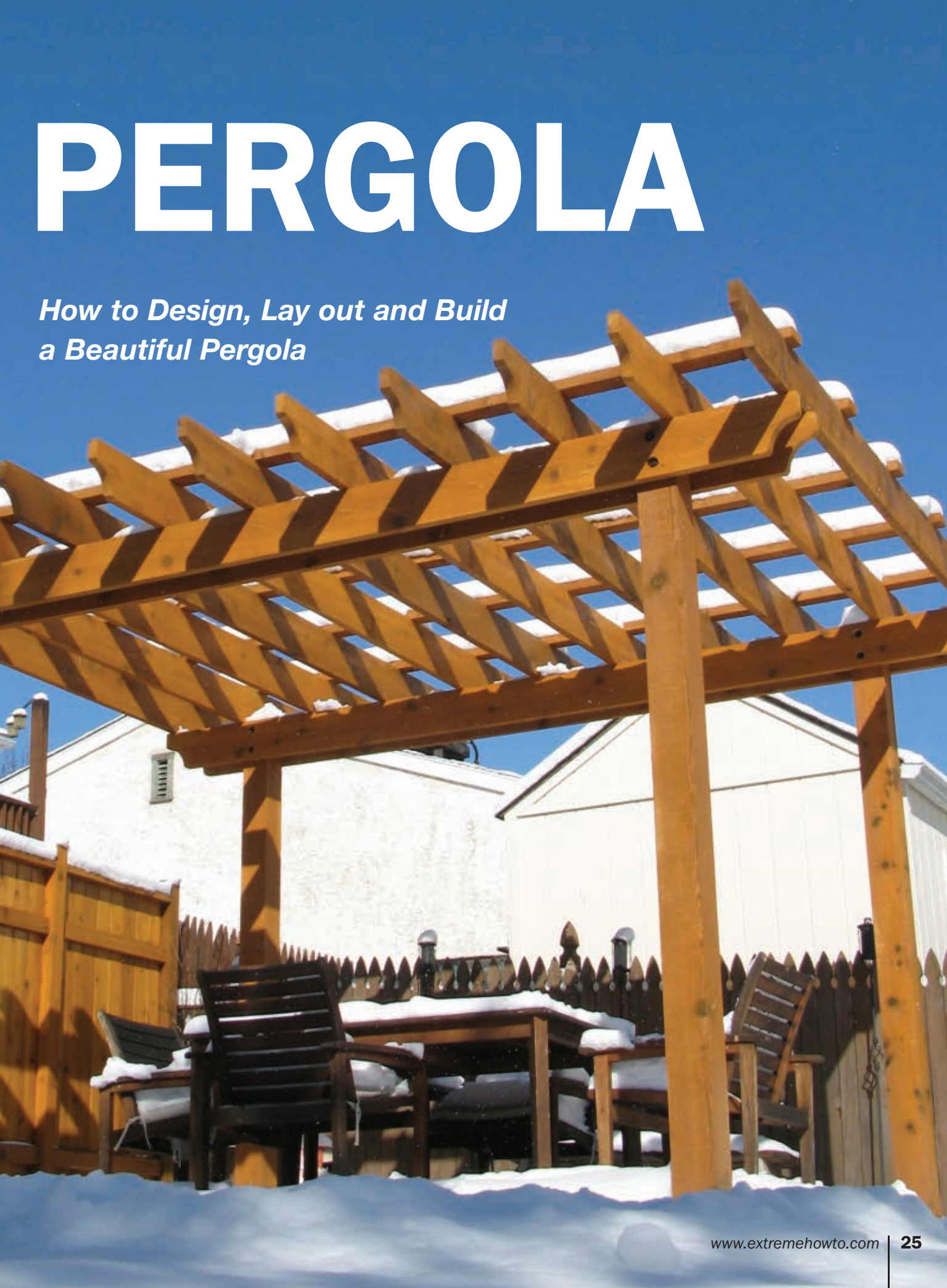
Proportion is key to designing a pergola that fits the space, especially in tight quarters.

There are four design rules I like to follow, otherwise pergolas can be more of an inductive (seat-of-the-pants) rather than deductive (following a prescribed plan) process. You don't have to be Da Vinci, but it takes a decent eye to "Goldilocks" the proportions: Too skinny and tall looks like a tower; too short and wide looks like a table. The girder should be 80 inches minimum from the ground, the same as an interior doorway. If there's a ceiling fan, I want 88 inches under those blades, if not more. Finally, for cantilevering past the posts, my feeling is that anything less than 12 inches looks less than graceful. The pergola shown here has 18-inch overhangs.



# PERGOLA

***How to Design, Lay out and Build a Beautiful Pergola***



# BUILDING A PERGOLA

If you have to nestle the unit in a small space like a backyard nook, site lines from the house, interior windows and other egress points should be investigated and considered.

In a larger space, working in basic units (8 feet, 10 feet etc.) is a little easier because there are fewer reference points to show that something is out of balance or otherwise encroaching on another visual element of the landscape. And, I build in design elements so that I can make on-the-fly tweaks to the basic design as the unit comes together. More on that later …

## ROUGH-SITING, GRADING AND TRENCHING

Rough-siting the structure is typically basic. Where I build there's a 4-foot setback from the property line to the edge of any structure. Since this pergola is nestled in a corner, my rough layout was pretty much done for me by the existing fences on the adjacent properties. Nevertheless, I spent considerable time measuring from known control points located on the property. This showed me which fences were not built on the true property lines (who's surprised?) and exactly where to site the footings.

There's a big payoff to being careful and thorough here. For example, the fences built into the corner of the property weren't square to one another either, so as a final filter to make sure the pergola's footprint was right where I wanted it, I measured off the house's back wall. Furthermore, I don't want a neighbor coming to me and saying I have to move my pergola because it's past the set-back.

Once I knew the pergola's footprint (within a few inches), I graded a level pad using a rented Toro Dingo and bucket attachment. With the level surface prepped I could proceed with final—or micro—layout. Note: Part of the reason for this excavation was that there was an existing brick fireplace, with footing, that needed to be demo'ed and carted away. Without so much obstruction, hacking out a reasonably small trench in the grass with a mattock and shovels would have been my excavation process.

If you're running power out to the structure and need to drop a trench (trench depth is 24 inches where I build), now's a good time to sink that bad boy. Using the Dingo's trencher attachment, I dug more than 30 feet of trench in about 20 minutes.

## THE RIGHT MATERIAL

**You can build pergolas from all flavors of material, from Cedar and Southern Pine to vinyl or hybrid structures of masonry, cultured stone veneers, steel posts, 2-by, 3-by and solid 4-by rafters—all of which can be left clear, stained, painted and so on. The point: There's a lot of room for imagination.**

**The design scope on this project was decidedly refined with a natural feel intended to last. I used rough-sawn Western Red Cedar 6-by and 2-by—primo stuff. The material delivered the right look, and when properly detailed will definitely stand the test of time.**

**I could have installed the cedar au natural, but The Western Red Cedar Lumber Association (WRCLA) recommends pre-staining—with true oil-based stain—prior to installation. This extends the material's service life, especially in ground contact. I used Sherwin Williams solvent-based DeckScapes with a cedar pigment. (Note: "Solvent-based" means oil, and oil does not clean up with water.) I could have used a clear finish, but I like the pigment, and the pigment provides more UV protection than clear stain.**

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# BUILDING A PERGOLA

## MICRO-LAYOUT

Micro-layout probably isn't necessary on every job, but in this case every inch of yard space mattered. I also like to build my stuff as square as possible, so instead of running strings all over the place (that would inevitably move and otherwise infuriate me) for marking post holes, I built a big box out of 2-by-8 stock—the sandbox—that acts as a full-size template for layout and securing posts. The box's interior dimensions are the same as the post locations' outside dimensions (plus 1/4 inch for fudge). Next, I square it up and brace each end with an A-brace—a diagonal in each corner and a spreader to connect them.

Before positioning the box for final layout, I hacked out roughly an 8-inch wide trench about 6 inches deep, which I then half filled with gravel. This facilitates three things: The rocks provide ground water movement under the box (it stays in place on this job); using rocks to "shim" the box level is easier; and the sandbox creates a level border for the pergola "floor" within the pitched grade of the yard.

With a full-size template that I could easily move, I re-measured from the property lines and the house. To ensure that I could tweak one corner of the box without moving another, I positioned sticks between the outside edge of the box and the straight run of fence. When the sticks touched

the fence, I was parallel to the property line in the East-West axis and I could make the final adjustments to the North-South axis more accurately.

Once the box was positioned, I could mark the center of each post hole using a nail and a hunk of caution tape or a carpenter's pencil.

## POSTING DOWN

Once I've got all four post-hole centers marked and kicker sticks out to the fences (or, absent a fence, a fixed point like a steel pipe hammered into the earth), I then move the box, handling it by the cross-piece of the A-brace. Next, I drill 15-inch diameter post holes no less than 36 inches deep. I used the Dingo again and it took about 5 minutes to drill each hole. As I drill the holes, I drop the fill dirt towards the center of the pad to keep it off the grass.

Augering leaves loose fill in the hole bottoms, which is easily fixed by over-drilling and tamping the material with the blunt end of a digging bar or sledge hammer. This is also the point where my inspector wants to inspect the footing, so the minute I know I'll be digging I call for inspection.

The final step is to dump about 4 inches of gravel into the hole

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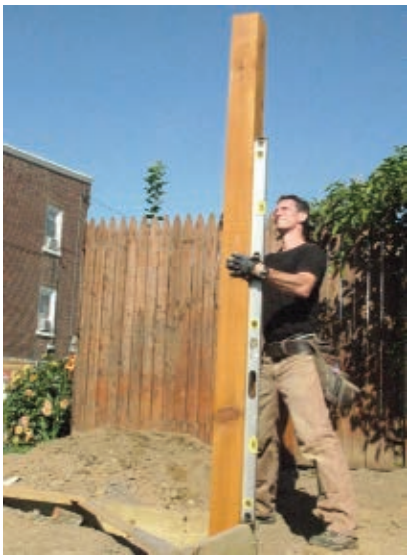
and tamp it. This layer of aggregate facilitates water movement around the bottom of the post.

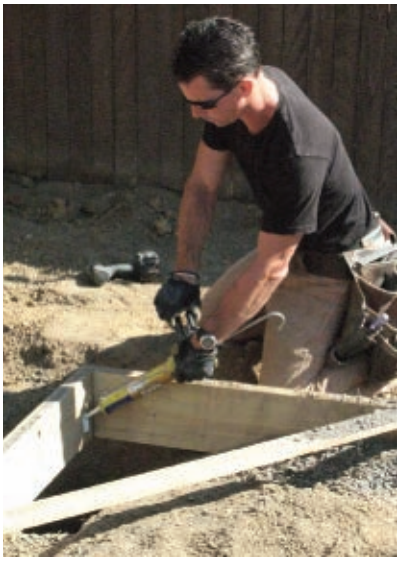
I then put the sandbox back on layout, which is easy to find because I left sticks in place to guide me, and then double-check for level in all directions.

## POSTING UP

With the footings inspected, now is when all this persnickety setup starts paying off.

Before setting the posts I lay them out to make sure they're long enough. One of my built-in design double-checks is running the posts high. Here's how I measure them: 40 inches below the sandbox's top edge + planned height to the bottom of the girder (in this case 80 inches) + girder width (7-1/2inches) + 12 inches for "fudge" factor. I set a post in each corner then plumb them in all directions. They're held fast with a few





screws through the sandbox into the post on each face. Also, if the box stays, I add construction adhesive before fastening.

To keep the posts from twisting or warping (they can, especially treated posts) and to support them during construction, I screw 2-by-4 diagonal kickers. I want

## MAKING THE CONNECTIONS

Many of the framing, cutting, and layout techniques used to build this freestanding pergola can be adapted to a pergola that covers an existing patio space and/or connects to the house. Here's what I'm thinking when I approach such a project.

**Posts and Patios.** For a paver patio, you can often remove a few pavers at the corners and excavate for posts. Then replace the pavers, cutting to fit. On a concrete pad, life is probably easier if you simply use a Simpson Strong-Tie bracket to make the connection between the concrete and the post.

**Decks.** I've seen a lot of … how do I say this politely … contraptions intended to be pergolas woven into existing deck structures. Some use the existing guardrails as pergola posts while others go a different route. A rule of thumb for me is that I like to connect my pergola post to the deck framing directly—and add blocking between the joists to support it yet further. If I need to make any alterations to the guardrail, then I do so on a case-by-case basis. Bottom line: Make sure whatever you weave into the guardrail system meets your local building code.

**Spans.** Lots of people have questions about how far they can span a pergola girder. The answer is: There is no single answer. Pergolas only support their own weight. However, I've seen 2-by-8s spread 18 feet that grin like a smiley face. You need meat simply for the girder to hold itself up. Gravity never takes a break. I use a double 2-by-8 almost as a minimum, purely based on aesthetics. If I have to span more than a dozen feet, I'm going up to 2-by-10. If I have to span 16 feet or more I'm going 2-by-12 and I'm adding knee braces—angle brackets in each corner—to cut down the span if not an intermediate post. Bottom line: I like to trust my eye on this matter as much as my mind. I'm fairly adamant about overbuilding in the first place, but after a career in this field, I know that if it looks too slender or lean or wimpy, it probably is.

**Connecting to the House.** I often see pergola rafters on decks connected to the house via a ledger board—just like the deck. And because the ledger board is doing the same basic job as the deck's ledger I detail it the same. I remove the house's cladding, paper and flash the opening, then fasten. Simpson, LedgerLok, GRK, or other ledger screws are ideal in this application.

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# BUILDING A PERGOLA

four of them at least 6 feet up on the post down to the middle of the sand box. Another best practice from WRCLA is to use crushed, tamped gravel as media to fill the post hole and secure the post. Also, I understand the Cedar Association wants no water trapped around the post but I'm personally comfortable (with rocks at the post base) pouring a 60-pound mooring of quick-setting concrete about 4 inches up from the post bottom. I haven't found anything that delivers a more stable, faster way to build a footing.

## FRAMING LAYOUT

I get lots of mileage from the sandbox.

As I begin laying out and cutting the girders and rafters, I know my posts are where I intend them to be and, because I have an integral anchor point, they won't move. Furthermore, I can climb on the structure during installation.

**Rafters.** Step One for the rafters is to crown each one, then cut them to length. I square rough-sawn stock on each end before detailing the rafter tail.

There are a bazillion ways to detail rafter tails and this is the place where you can really have some design-fun. Or, take it simple, like this basic but graceful chamfer.

Cutting these on a miter saw is fast for sure, but you need infeed/outfeed support for whacking the ends off 14-foot stock. On the other hand, I laid out and made consistent cuts with my wormdrive. First, I square the end. To get my chamfer, I line up 40 on the Speed Square with the square line and scribe the angle. (Note: This isn't a 40-degree angle; it's just the position on the square where the angle—which is 45 degrees—looks best.) I then make a pattern and use it to trace the rest of my cuts on the girders and rafters. The four girders get the same cut the rafters do before I lay out the tops for rafter locations.

On the bottom edge of each crowned rafter I measure and mark the cantilever location on each side, so I don't have to


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**Pergolas from VinylPatioKits.com do not require any staining, and the maintenance-free nature of vinyl means you'll spend more time enjoying your patio and less time with costly upkeep. If your vinyl patio cover does get dirty, cleaning is easy; simply hose off dirt and debris with a garden hose. If need be, you can use a mild cleaner such as dish detergent. Learn more at www.vinylpatiokits.com.**

fumble with my tape during installation.

**Girders.** After crowning the girders, I set all four on edge—crown up—and lay out rafter

spacing. If you've built the girders in a 16-inch matrix, you can simply pull 16 O.C. from one end, and end up with a full rafter on the other. If you have to get funky splitting them up in a different matrix, try starting your layout from the center and pulling from there to each edge. You may have to get creative with the spacing to make it work.

Next, I mark the inside of each girder for each post location. Because the posts are locked by the sandbox, I lay each girder up to the posts and trace the post locations right on the girder—we're talking dead-on accuracy.

Before starting assembly, if the timing works, apply some wood preservative to the exposed end-grain at the cut locations. If not, hit it after installation.

## ASSEMBLY

With the post tops running wild I can do a final double-check on the actual pergola height before it's too late to turn back. Footing holes drilled to different depths, more stone versus less stone in

the bottom of the hole, etc., can throw off rough post heights by inches. And, if need be, I can actually screw a board to the posts if the homeowner wants to see the final dimensions in real time, showing them what the actual pergola outline will look like. Once the final layout is settled, it's the 8-1/4-inch worm-drive to the rescue—two passes on each post sizes it.

I measure up from the already leveled sandbox and zap the post tops 1 inch shorter than the girder top (the gap is for wire and conduit for lights/ceiling fan).

A 6-foot step ladder gets you close to the proper height, however, you could screw 2-by-6s to the posts then bridge those with a couple of 2-by-12s for staging. However you choose to get up there, do it safely.

**Installing Girders.** I measure up from the sandbox to the bottom of my girder location and

strike a light line. I tack a 2-by cleat below the line on each post and then dab some construction adhesive on the post. Next, I rest the girder on the cleat and tack it with gun nails or screws, making

# BUILDING A PERGOLA

sure to set the nails in the corners such that they don't interfere with through-bolts.

I lay the bolt heads out evenly on the girder. I then drill a small (1/4-inch) pilot hole through each girder and the post. With

the hole drilled, I follow up with a boring bit or 1-1/2-inch paddle bit to relieve a space for the bolt head and washer on each side. Note: I primed and spray-painted the through-bolts black. I'm not

sure if anybody but me notices, but I like it.

**Installing Rafters.** With the rafter bottoms and girder tops laid out, placing the rafters dead-on-money is easy, just line up the lines then toe-nail (or screw) through each rafter into each girder. This is soooo much easier than measuring everything from the top of a ladder.

**Rafter Ties.** Rafter-ties—2-by-4s running perpendicular to the rafters—stabilize the rafters and add another visual element to the system. Lay 'em out; gun 'em down. I used five on this pergola. Safety and Layout Note: I install rafter stays over the girders first. I think they look good there. Plus, if you start walking around in rafters without stays, expect them to tip over and for you to get hurt. With the first two stays in place, I then divide the space between them in half for a center stay. Divide the spaces

left and right of the center stay in half, and you'll have evenly spaced rafter stays with minimum math.

## LANDSCAPING

A pergola's earthmoving work requires that you either get in touch with your inner landscaper, hardscaper, or mason—or that you sub-out those trades to finish the pergola. A beautiful structure built over a mud puddle just won't win you any awards.

## SUN OR SHADE, THE CHOICE IS YOURS

**Retractable patio awnings are a wonderful way to expand your living space and save money on cooling costs. "They provide shade and sun protection when you want it, yet you simply retract it when you don't," says Don Buteau, president of NuImage Awnings, a national manufacturer located in Auburn, Maine. The solution is dyed acrylic fabric, available in over 45 of today's most popular colors, which will not fade or deteriorate while providing more than 94-percent blockage of harmful UV rays. In addition, it will feel up to 20 degrees cooler under your awning. NuImage Awnings ships its entire patio awning product line completely assembled for easy installation. A retractable awning can easily be mounted to walls or roofs with the proper brackets. A typical model weighs about 10 pounds per foot of width. The key is to locate the studs or rafters and use high-quality lag bolts properly sized for the application. Cool comfort, plus energy savings, makes a retractable awning a great addition to any home. Learn more at www.nuimageawnings.com**

While a lot of pergolas get hardscape "floors" (your hardscape guy will love you if you've left the sand-box border for him), it's not necessary. Others, on the other hand, are integrated into existing structures. And then there's this one: The floor is grass—about as green as you can get. And, I hasten to add, installing sod instead of a hardscape clipped about $3,000 from the budget.

The Dingo played another significant role here, carting various media—crushed stone, fill dirt, topsoil, sod and bark mulch—all of which were required in bulk to re-landscape this project and tidy up existing planting beds.

## FINAL DETAILS

Double-extra-triple stain all those end-grains, especially the post tops and bolt holes.

For a lawn that's been chewed up, I find the best medicine (at least where I live) is water, a fertilizer like Milorganite, and some lime. For areas that need to be re-seeded, I've had terrific luck with Scott's PatchMaster grass seed/mulch mix and Scott's seeds.

Furthermore, seed or sod needs water. Lots of water. I find it's best to set up a spike sprinkler and leave it in position, using it regularly until the grass is established.

Whatever you call it—pergola, patio cover, or one of those garden thingies—your work remains to shelter and luxuriate a beat-down backyard with shadow and form only a structure like this can provide. EHT

***Editor's Note:*** *Mark Clement is a remodeler, live action trade show presenter, and author of* The Carpenter's Notebook, *A Novel. www.FormalFarmHouse.com*

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# STAMPED WITH STYLE

## *Build a Patio with Decorative Concrete*

**By Monte Burch**

Concrete is one of mankind's most useful inventions, and also one of the oldest. Highways, sidewalks, bridges, buildings, all are made of this utilitarian and often unglamorous product. Concrete, however, doesn't have to be mundane. With a variety of techniques concrete can be made extremely decorative. Stained and stamped with a variety of patterns, concrete can look like bricks, cobblestone, flagstone, even wood, or a variety of unusual artistic patterns. Stained and stamped concrete can turn a ho-hum slab into a beautiful patio or sidewalk. It is also a great way of redoing an old, deteriorated walk or patio—simply pour fresh concrete over the old.

### PREP THE SITE

The first step, as in any concrete project, is proper preparation of the site and building a form to hold the concrete in the desired shape. The sub-grade must be uniformly graded and evenly compacted. If pouring in hot weather, it is recommended to soak the ground prior to the pour. The sub-base material, however, must be dry at the time of the pour.

If pouring a patio or walk, the mix and reinforcing should meet the strengths of the project needs and be suitable for external paving. The formwork should be set to establish proper drainage of the area and to be used for screeding and layout. A minimum of 2-percent slope

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should be allowed for exterior paving sections. All grade pins should be set below grade to prevent interfering with the texturing process. All formwork should be properly squared, and also squared to any existing structures. This is especially important if using a patterned texturing tool.


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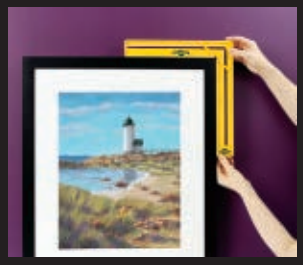

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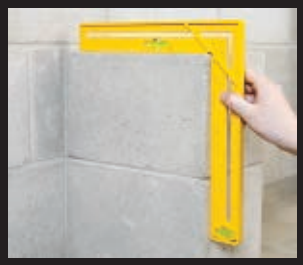

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*As with any concrete project, the proper form must be constructed to hold the concrete until it sets.*

*For an exterior project, the form must have a grade of at least 2 percent to allow for water runoff.*

*If using pattern stamps and a square or rectangular pour, make sure the form is assembled square.*

*The form can, however, incorporate rounded or irregular edges, with the stamps simply extending past the form boards.*

## COLORFUL CONCRETE

Two methods are used for coloring concrete, a spread-on color hardener or an integral colorant. Both can be used with ready-mixed or bagged materials. Color hardener has some dust and health hazards in application due to the content of the silica sand involved. The

# mortrex
## concrete mixing tool

**1.** Simply pour the water to the top of the lower mixing paddle.

**2.** Now add 2/3rds of a 60 lb. bag of concrete.

**3.** Stir and agitate. Then add final 1/3 of concrete. Stir and agitate.

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The Mortrex Concrete Mixing Tool replaces the need for big messy wheelbarrows which are cumbersome to maneuver across rough terrain and are impossible to transport up and down stairs. **The Mortrex tool, when used with a 5 gallon bucket, allows you to mix concrete in less than a half minute and easily carry it to where you need to go.** No matter where you take it, you will not need electric or batteries to power it.

The convenience of this industry – proven tool is that the amounts of water and concrete needed to make a perfect mix have been calculated for you. **We've "done the math" for you!** Simply rinse off your bucket and tool when your finished. We're sure you'll appreciate the time and effort that the Mortrex Concrete Mixing Tool saves you.

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# STAMPED WITH STYLE

*The simplest method of coloring the concrete is with and integral coloring agent, such as Matcrete Integral Color. The coloring agent can be mixed at the job site in ready-mix deliveries, or in small batches using bagged concrete.*

technique shown involves integral coloring products from Matcrete (www.Matcrete.com).

The Matcrete Integral Color is a pre-measured admixture for coloring ready-mixed concrete during batching. The pigments are lime-proof, pure synthetic mineral oxides for all concrete flat-work installations, interior floors and exterior hardscapes. The system also works for pre-cast, tilt-up and cast-in-place applications. Packaged in 25-pound disintegrating bags, the product is available in a wide range of colors. The dosage rate found with the color swatch is the amount of color needed to tint 94 pounds of concrete. Typical dosage rates range from 1/4 to 4 pounds of Matcrete Integral Color per sack (94 pounds of cement). Exceeding 10-percent color content can have an adverse affect on the strength of the concrete. If a more vibrant color is desired, consider using Matcrete Dustone Color Hardener which,

*Due to a wet area, as well as a sewer drain line near the pour, the concrete was delivered to the form from the ready-mix truck with a tractor bucket.*

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due to its application, is not limited to these same restrictions and in fact can increase surface strength. But you must follow all safety regulations.

Integral Color is added to the concrete in the mixing drum. If mixed at the plant, the drum must be cleaned, and approximately two-thirds of the mix water and one-half of the aggregates needed should be added to the drum. Do not use slurry water or reclaimed aggregates. Add the correct amount of Matcrete Integral Color to the drum and mix at full charging speed for three to five minutes or until all bags break apart and the pigment is distributed evenly. Add the balance of the ingredients (water, aggregates, cement and admixtures) and mix at full charging speed for 8 to 10 minutes (80 to 100 revolutions). It is the ready-mix supplier's responsibility to make sure the bags have fully disintegrated. Note: A ready-mix company will probably charge a small fee for extra cleaning of the drum.

*The colored concrete is poured in the form and shoveled or pulled into all portions of the form.*

If coloring the concrete at the jobsite, open the bag and pour the pigment directly into the drum, then discard the bag. Again mix thoroughly before distribution. Mix color and pre-bagged concrete according to the manufacturer's specific instructions.

*A screed board is used to level the concrete to the form boards.*

# STAMPED WITH STYLE

*A bull float is used to smooth and float the concrete surface.*

*The edges should be smoothed using an edger, and then a float used to further smooth out the edges.*

## TEXTURE OPTIONS

The colored concrete can be finished in a variety of means. Use a bull float after striking off the slab. For most finishes, use wood bull floats and derbies, not magnesium. Wait for the bleed water sheen to disappear before you start floating and troweling. Do not over-trowel or start troweling late as this leads to burns and dark spots.

Following are some of the various textures that can be used with Matcrete Integral Color:

**Broomed:** Made by pulling special brooms across stiff, freshly floated or troweled concrete surface. For variety, broomed texture can be heavy or light, or in straight or wavy lines.

**Exposed Aggregate:** Aggregate is exposed by "seeding" the fresh concrete with aggregate which can be colored, sparkling, fractured or smooth. Before the concrete sets thoroughly, a pressure washer is used to wash away some of the top surface and expose the aggregate. Set-retarding compounds are often used to slow the set, but make sure you follow the manufacturer's instructions. The aggregate can also be exposed by removing the surface cement with acid etching, sand blasting, grinding or hammering. Exposure level can vary from barely revealing fine aggregate to up to 1/3 of the diameter of coarse aggregate exposed.

**Stamping or imprinting:** Stamping tools are pressed into the concrete to create a pattern and then removed. A powder release agent or plastic sheet is placed on the concrete surface after floating and troweling.

## STAMPING IN DETAIL

A wide variety of stamps are available ranging in design from brick, cobblestone, stone, and ashlar slate to patterns that resemble wooden planks. Matcrete has over 175 patterns to choose from. The concrete stamps are made from a high-quality urethane with fixed handles designed for quick and easy placement. Stamps are available as seamless imprinting or in set patterns. Seamless texture or non-directional patterns are the easiest and fastest way of stamping concrete as there is no set direction or lay-down pattern to follow. Regardless, a wide set of variables is involved in properly imprinting concrete including: temperature, sunlight or shade, wind, access and the depth of the stamping tool.

*Before stamping, a release agent such as Matcrete Release Powder should be applied. The product not only prevents the stamps from sticking, but also provides an additional color. The agent must be air-entrained before use.*

*The release powder is sprinkled uniformly on the surface.*

*Once the concrete is sturdy enough to support a person and the stamps, the stamps are applied. In most instances you will need enough stamps to go across one end of the pour. Position one stamp, following the manufacturer's instructions.*

Regardless of the design used, the concrete should be covered with either a plastic membrane or release powder to prevent the cement from sticking to the concrete stamp. Matcrete

Release Powder, a fine talc-like powder, is not only quick and easy to use, it adds a secondary color to the Color Hardened concrete. Before application of the release powder, it should be air-entrained to beat air back into it. The fine powder settles during transportation. A portable electric drill and paddle mixer works quite well. Broadcast the powder over the surface by hand, brush or even the lid from the bucket. Broadcast as low to the surface as possible, tossing the powder across and not down on the surface. Avoid lumps on the surface, as this may create blank spots in the texture. The rate of application depends on the concrete set

*Position the remaining stamps in the row and tamp as per the instructions. In some instances you can "walk" on the stamps for the imprint, but a tamper makes the chore more precise.*

*Make sure you correctly lift the stamps and do not drag or shift them on the concrete. Then simply repeat the process, applying the stamps according to the manufacturer's instructions for the specific stamps.*

*At the edges, allow the stamping tool to hang off the edge.*

*The stamped concrete and release agent should be allowed to cure for at least 48 hours.*

rate, depth of desired texture and wind speed. Do not apply this on a windy day. Approximately 3-1/2 pounds is required per 100 feet.

## PATTERNED STAMPING

Patterned stamping requires careful layout and tool placement. Joint spacing must be considered. You will need stamping tools to span the entire slab in one direction and begin the second row. It's a good idea to lay out the design and even lay out the stamping tools in the pattern desired next to the pour, so you're sure of the tool positioning. Once you have determined the pattern, and that the concrete will hold up to the weight of the person and tool, you're ready to place the first stamp.

*Sweep off the excess powder. If possible, capture the excess powder for proper disposal.*

Place the stamp flat on the surface of the concrete using the handles on the back. If possible, start against the structure or any straight edge that will permit the tool to remain square. Do not drag the stamp across the concrete as this will scuff and scratch the surface and mar the imprint. Continue to set the remaining stamping tools, following the instructions for that particular pattern. Patterned tools are color-coded to help reduce pattern repeat on the surface. Rotate the colors so the surface is randomly stamped.

Once all the tools are in place, use a pounder or tamping tool to create the imprint. If the concrete is too soft to continue stamping you should refrain from stamping until it has the same consistency and will properly support the weight of the person and tool. Continue to move and tamp the tools in the direction of the pour until the entire surface has been imprinted. Always set the next row tight to the first to keep the lines square. Using a small Seamless Texture Skin, work around hard-to-reach edges

# STAMPED WITH STYLE

*Using a pressure washer with at least 2,000 psi, wash the remaining powder from the surface.*

*You may also wish to use a soft-bristle push broom to remove stubborn areas.*

such as steps, walls and columns. Additional detailing can be done using a touch wheel and chisels.

## SEAMLESS TEXTURING

You will need a minimum of three large Seamless Texture Skins. Place the first flat on the surface using the handles. Then place the second and third, overlapping each by 4 to 6 inches. Once you have stamped the texture evenly into the concrete you must underlap the first skin from the other two before you can pick it up and move into the next position. Repeat the process until you have covered the complete area. When you move each stamp, rotate it 90 degrees to ensure there is no repeat of the design.

*An old, discolored sidewalk or patio can be brightened by pouring new concrete over the old and creating a colored and stamped design.*

## CURING AND CLEANUP

The next steps are curing and wash-down. The main purpose of curing is to increase durability and reduce early carbonation on the surface. Keeping the powdered release agent on the

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surface for a period of seven days will help prevent early carbonation by limiting the exposure to carbon dioxide in the atmosphere. Regardless, it is recommended the concrete has a minimum of 48 hours to harden before the wash-down procedure.

The first step is to remove all forms, then sweep excess release powder from the surface. Collect as much of the release powder as possible in a ditch or sump hole. Then dampen the concrete surface with water. Using a pressure washer with a minimum of 2,000 psi, clean off the release powder. Working the dampened surface with a soft-bristle push broom will also help. Matcrete Antique Release and Efflorescence remover can also be used to remove stubborn stains. Clean the concrete surface until the water runs clear and the overall appearance is desired.

The final step is to apply a sealer to protect the concrete and seal in the coloring. A number of sealers are available, and it's extremely important to follow the directions for the specific sealer. The concrete should be sufficiently cured and moisture migration complete. The surface must be free of dust, debris, moisture and any other contaminants. The sealer shown is TK Products Achro Kure, available from Decorative Concrete Supply, www.murraydecorative.com, a good source for all the decorative concrete products and tools. The first coat of sealer should be applied evenly with a high-pressure sprayer. The second coat can be applied when the first coat has thoroughly dried (three hour re-coat time). Depending on the porosity of the concrete, you may need a third coat. Foot traffic is permitted within 24 hours and vehicular within 72 hours. **EHT**

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# GUTTERS & DOWNSPOUTS FOR

**By Matt Weber**

*Install it yourself to protect your home and save on labor costs.*

In general, gutters and downspouts are far from the most glamorous feature of a home, but these systems are the unsung heroes that protect your house from water damage. By collecting roof runoff and diverting it away from the building envelope, gutters and downspouts help to prevent damage such as wood rot, mold and mildew.

The house shown in this article was built in 1978 and only had a single gutter and two downspouts installed at the front, with nothing on the rear. As a result, during a rainstorm the water was cascading off the rear of the roof and pounding a trench along the foundation wall, where it was seeping through the ground and migrating through the cinderblock, as evidenced by water stains on the interior of the wall. By installing a gutter and a couple of downspouts, the water is channeled away from that troublesome trench and diverted across the yard and away from the house walls.

Professional installation of metal gutters usually involves specialized equipment used to form gutters from sheet metal at the job site. One advantage of professional installation is that the gutters can be installed with a seamless system, which provides the best protection against leaks. Plus, the gutter contractor will be the guy working atop a ladder at the roof line, which is a big selling point for homeowners who aren't comfortable with the heights of roof work. However, for do-it-yourselfers who don't mind working on a ladder, you can save considerable labor costs by installing a gutter using the sectional systems available at retail outlets such as Lowe's Home Improvement Stores.

For this particular job, I picked up the materials at my local Lowe's, which distributes

# THE DIY'ER

Amerimax aluminum gutter systems. The first step is to sketch out your gutter system on paper so you can quantify the various components required. Measure your roof line and wall height to calculate the number of 10-foot sections of gutter and downspout you'll need. I was working with standard 5-inch gutters with a "K" profile. Next, account for end caps, seamers, inside or outside corner pieces, downspout elbows and end drops. You'll also need mastic for sealing the joints, downspout bands to fasten to the house, and sheet-metal screws to connect the downspout sections. To hang the gutter, you can choose from a variety of fastener types. I chose to use hidden fasteners that are held to the fascia with screws. Here's how a homeowner can install a gutter, protect their home and save some cash by doing it themselves …

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## GETTING STARTED

When installing a gutter system, be prepared to spend a lot of time working at potentially dangerous heights. Because so much roof work is involved, I highly recommend attaching a ladder stabilizer to the top of your ladder. I picked up a Werner Ladder Stabilizer at Lowe's, which proved on this job to be the best 25 bucks I could have spent. Not only does this simple bracket attachment safely prevent the ladder from swaying from left to right while you're standing on it, but it also provides a 10-inch standoff from the roof line, which makes it easy to access the fascia and gutter without obstruction from the ladder. The stabilizer also rests on the roof, rather than on the shingles, fascia or house siding, so there's no worry of accidental damage from contact with the ladder.

To begin installation, safely position the ladder on even ground with the ladder stabilizer firmly supported by the roof deck. Climb up to one corner and hook the end of a chalk line at the point where you want the top edge of the gutter to terminate. Unreel the line as you move to the opposite end of the fascia. At that corner, first level

the string, and then drop the string about 1 inch per 40-foot run and snap the chalk line. This achieves a slope that helps gravity pull water to the downspout locations. If you have a long run with downspouts at both ends of the gutter, you can slope the gutter from its midpoint toward both of the book-ending downspouts.

## PREASSEMBLY

Even when using a ladder stabilizer, the safest and easiest way to work is to assemble as much of the gutter system on the ground as possible.

I designed this particular gutter system to have a downspout at each end, which required an "end drop" at each downspout location. To join the end drop to the gutter—or to join any gutter

section to another—requires a "seamer." The seamer is a 3-inch wide piece of aluminum in a "K" profile to match the gutter. First, apply gutter sealant or mastic to the top side of the seamer piece. Then, wrap the seamer around the butted gutter components

*The various gutter components are connected with aluminum seamers and gutter mastic.*

from below. The front of the seamer hooks to the front edge of the gutter. The rear of the seamer extends above the rear of the gutter, and you fold this extended flap of metal over the rear edge of the gutter. Use pliers to crimp both the front and rear lip of the seamer tightly onto the gutter. Then, cover the visible seam inside the gutter with a generous bead of mastic.

With the end drops positioned over the corner of each wall, I still had 12-1/2 inches of gutter between the end drop and the end of the roof. This required cutting a short section of gutter, seaming the piece onto the end drop, and then applying an end cap using the gutter mastic. Before installing the gutter section, give the mastic a few hours to dry and gain some rigidity at the joints.

*An end cap ensures the water exits the gutter in a controlled flow through the downspout.*

## CUTTING TO SIZE

When assembling the gutter and downspouts, you will likely have to cut some of the materials to length. One basic method is to clamp the material firmly to a couple of saw horses and cut using a hacksaw. A good pair of metal snips can also do the job.

Either of those methods work fine, but I used a sliding miter saw with a fine-toothed blade turned backwards. The speed of the blade combined with the backwards teeth make a nice, clean cut with very little operator effort. Note: When cutting gutter material on the miter saw, turn the section upside down so the cut enters the more stable underside of the gutter rather than the top edges.

## FASTENERS

Gutter fasteners come in a wide variety of styles and shapes. Some of the options include screw and ferrule, fascia brackets, roof hangers with strap, or hidden hangers—the kind I chose. The hidden hangers clip over the rear edge of the gutter and hook beneath the front lip. Each hidden fastener comes with a 1/4-inch hex-head screw that you power drive into the fascia board to hang the gutter.

I pre-attached the hidden hangers while assembling the gutter section at ground level. Simply clip them in place every 2 feet along the length of the gutter section. Make sure to locate a fastener near the end of each section to minimize stress at the joint locations.

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## HANGING IT SOLO

As is usually the case, I was working without any help, but if you can recruit a friend or neighbor to help install the gutter then I suggest doing so. Although the gutter sections are surprisingly very lightweight, they can be rather cumbersome for a single individual to carry up the ladder and nail in place. But that's what I did.

To install the first section I placed the ladder on the roof about midway of where the first section would be installed. I hauled the gutter section to the top, positioned the end about 1 inch beyond the roof line, and—holding the section from the middle of the gutter—I slightly tilted it so its top edge matched the slope of my chalk line. I then zapped in the screw of the center fastener.

The aluminum gutters are so lightweight that a single screw will hold the section temporarily in place. By having the center screw secured, I had a pivot point where I could more accurately position the gutter along the chalk line and drive home the remaining screws to anchor the gutter.

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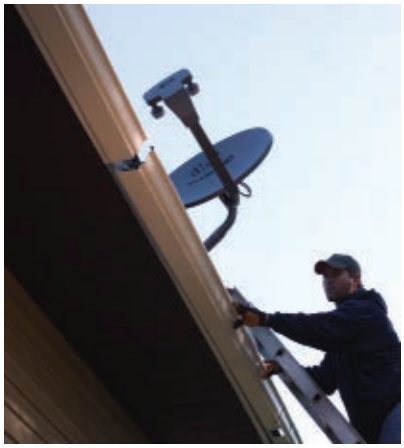
And, that's pretty much the basics of hanging the gutter: Rinse and repeat. Start at one end and work toward the opposite, assembling as much of the gutter on the ground as possible and securing it with fasteners at the roof line. The only difference is that you will have to seam together the separate gutter sections at the roof line rather than on the ground.



*The flange is secured in the end drop with gutter sealant and screws (screws not pictured).*

## DOWNSPOUTS

Once the gutter was completed with end drops located at each wall corner, I then assembled the downspouts. To do so, I temporarily duct-taped an elbow to the flange outlet of each end drop. (The flanges are secured to the end drops using mastic and sheet metal screws.) I used a straight edge to follow the trajectory of the elbow toward the wall where the second elbow would

*I used a straight ruler to measure the downspout needed between two elbows.*

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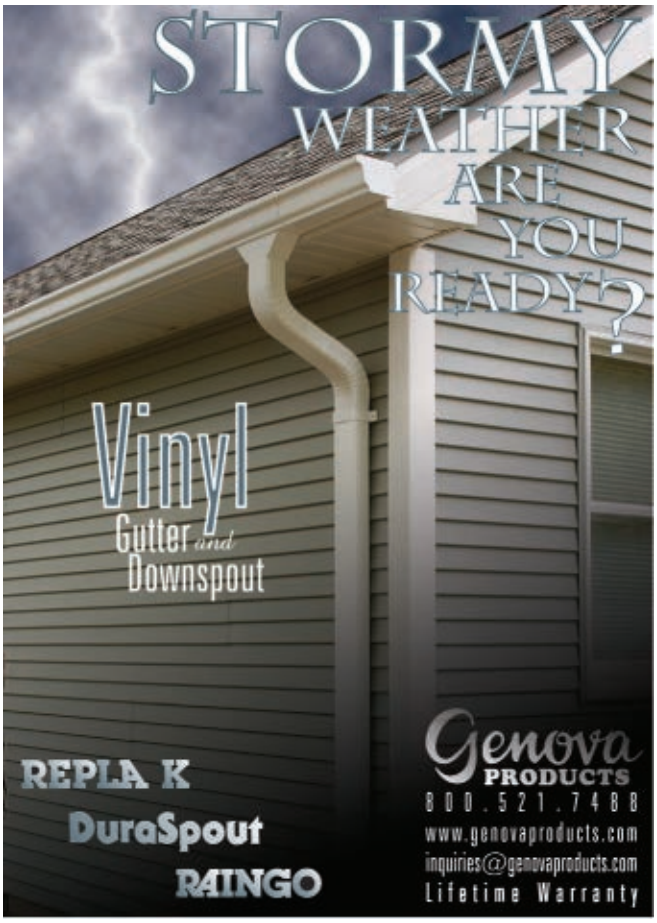

be located. I then temporarily taped the second elbow to the wall. Next, I used a ruler to measure the downspout section I needed to install between the two elbows.

*The downspout sections connect with slip joints, each fastened with at least two aluminum screws driven into predrilled holes.*

Note that each downspout and elbow has one end crimped. The parts are joined by fitting the larger end of one over the smaller end of the other. In other words, downspouts are connected using a slip joint (not a butt joint like the gutters), so be sure to account for the overlapping slip joint when measuring—usually 1 inch of downspout overlapping the elbow at each end.

Assemble the downspout at the ground level, driving primed sheet-metal screws into predrilled holes at each joint in the downspout. Use two screws per joint.

Fasten the downspouts snugly against the wall, with two flexible aluminum downspout bands per 10-foot section using nails

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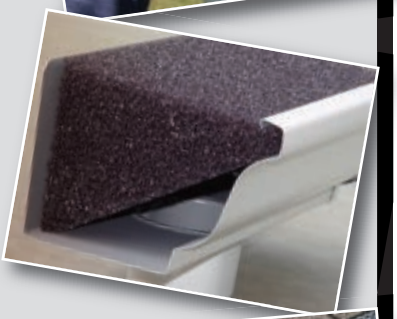
or screws. A little temporary duct tape helps to keep the downspout stationary while fastening.

Finally, attach a front or side elbow at the downspout's bottom to direct water away from the house foundation. In some cases you can use a section of downspout as an extension. However, I used a length of Flex-Drain, which can bend and extend from 3 to 12 feet to easily aim the water where you want it. **EHT**

## COVER UP FOR EASY MAINTENANCE

Gutter protection is a hot item among the many homeowners who groan at the prospect of climbing onto the roof to scrape muck out of their gutters. The idea behind these products is to prevent leaves and other debris from accumulating in the gutter system, which can cause blockage and in some areas lead to ice dams. Here are three different designs to consider when selecting a gutter protection device.

LeafBlox is a product that the *EHT* staff affectionately refers to as "fuzzy caterpillars" or "big pipe cleaners." That's what they look like anyway, but this interesting design for a gutter guard costs a fraction of many competitive systems and provides 360-degree internal protection to block leaves, branches and other debris, including nesting birds, insects or squirrels from getting into your rain gutters. Simple to install by hand, the LeafBlox product also prevents standing water in your rain gutters that can be a breeding ground for insects and disease. Visit www.leafblox.com.



Gutter Filler is a porous, foam-like product that fits popular gutter sizes and styles. Each style is cut to fit inside your gutter and seals out all debris, while allowing water to quickly flow through it. Gutter Filler fills your gutters and utilizes the entire surface area of your gutters to capture all of the water. It can handle water flows of up to 24 inches per hour, and it all goes into your downspout. The product screens pine straw, maple whirlies, seeds and small pieces of debris that tend to get into your gutters or entirely block your covers and screens, preventing any water from entering the gutters. Gutter Filler also stops mosquitoes from breeding in your gutters by preventing access to water, and it includes built-in BioCide to stop the growth of moss, mold and mildew. Gutter Filler comes with a 20-year, no-clog guarantee. Visit www.gutterfiller.com.

Gutter Guard from Amerimax is a system of hinged metal covers with a convex design that covers both the gutters and the edge of the roof to prevent leaves, twigs and other debris accumulation. Made of galvanized steel, aluminum, copper or powder-coated steel, the Gutter Guards simply snap onto the front edge of the gutter using hinged stainless steel clips. The guards install in seconds with the push of the thumb, and if there ever is a need to clean them, just flip up the guards at the hinge for easy gutter access. Visit www.amerimax.com.

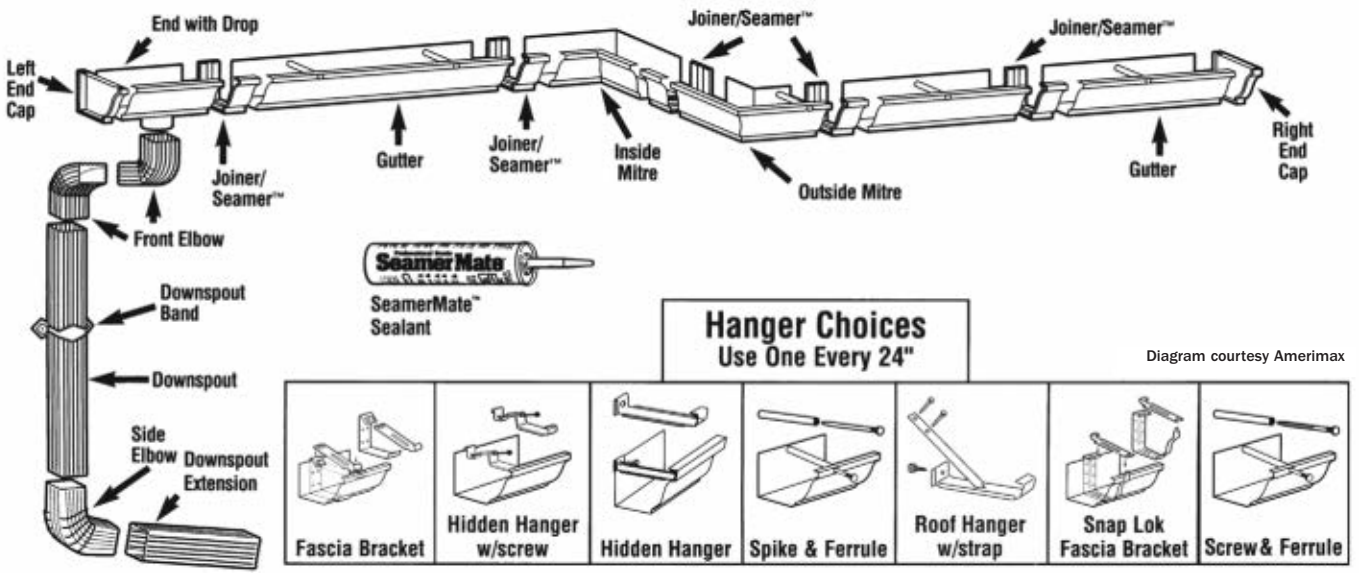



Diagram courtesy Amerimax

## QUESTIONS ON CORNERS?

The installation shown in this article is pretty straightforward, with no corners to overcome during the project. However, creating corners is easy with sectional gutter systems. The corner sections are sold as pre-manufactured components: both Outside Miters and Inside Miters are available, so you don't have to worry about seaming a 45-degree cut. All that's required is careful measurement of the components, and then to seam the two butted square sides of the miter piece into the gutter run as usual.

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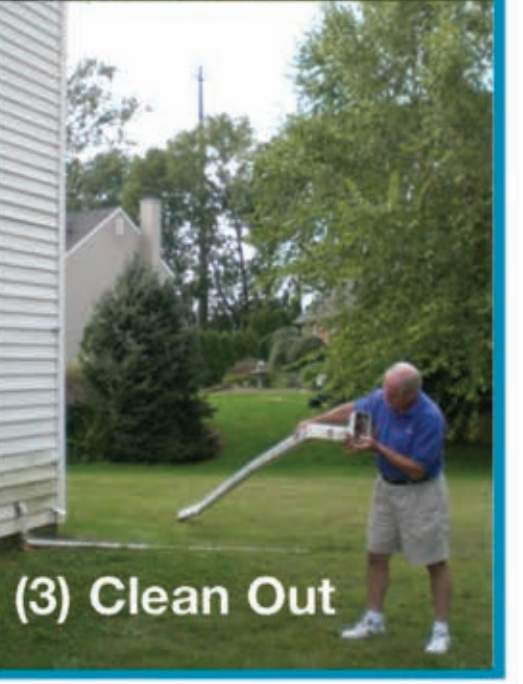
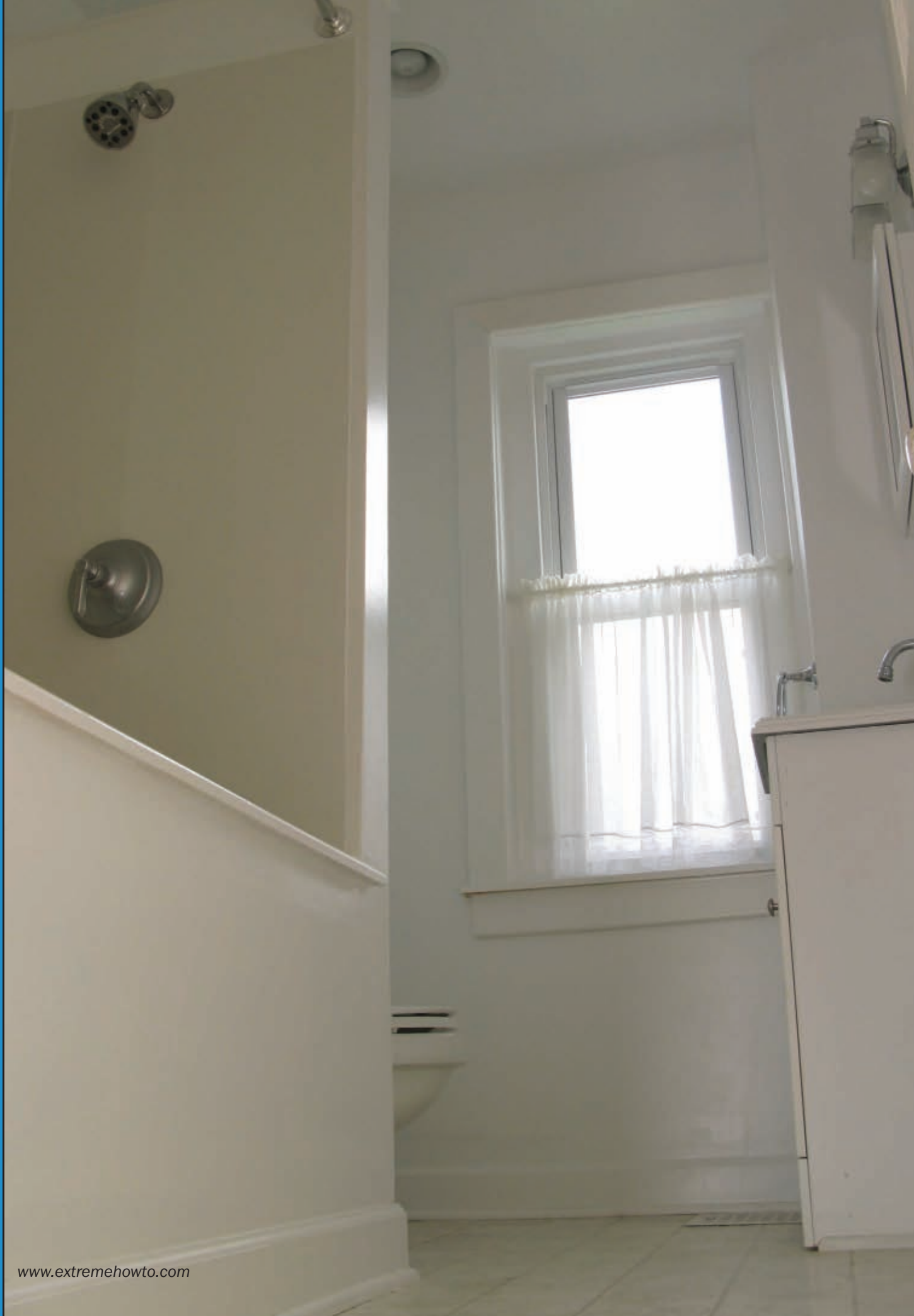




# BATHROOM ON A BUDGET

## *Part 2 of Creating a Beautiful and Budget-conscious Bathroom Overhaul*

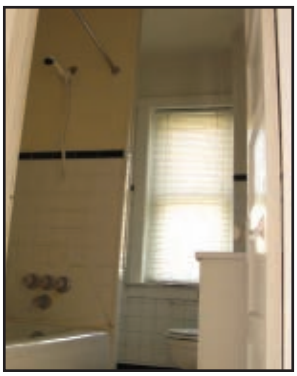
***(See the entire story at www.extremehowto.com)***

### AFTER DEMOLISHING, BUILD IT BACK UP

Once you have gutted the old bathroom, it's time to inspect and upgrade insulation. One place that is often overlooked, insulation-wise, is in the floor framing. I always install batt insulation in a joist bay or two along the exterior wall to help seal the room. And, I insulate around water and drain pipes at the same time. It helps conserve hot water, no doubt, but it also helps quell the noises from waste draining through PVC pipe.

**New Subfloor.** The plumber leaves his supply and drain pipes "stubbed out" for the shower, sink and toilet. Transferring these measurements from real space onto a sheet of plywood is tricky work—some measurement is always a little off for me. To increase accuracy and speed I use a piece of 3/4-inch thick, 2-foot wide rigid foam insulation as a "blank." I lay it in place

**By Mark Clement**



*Can you say train wreck? The sink and toilet are jammed into the same corner, truncating egress between the tub and corner of the vanity. The tub itself is "tiled" with plastic tile sheets. All materials were low-budget upon installation and were not only poorly detailed but (gag) beyond cleaning.*

as if it were the subfloor, but since it only weighs about a pound, I can rest it right on top of the pipes. Now all I have to do is firmly press on top of it at the stubbed pipes (which I've asked the plumber to leave at the same heights above the floor), and this leaves an indentation in the foam, creating a full-size template. I then cut out the holes in the foam, transfer it to my plywood, then cut it out right the first time. I love this.

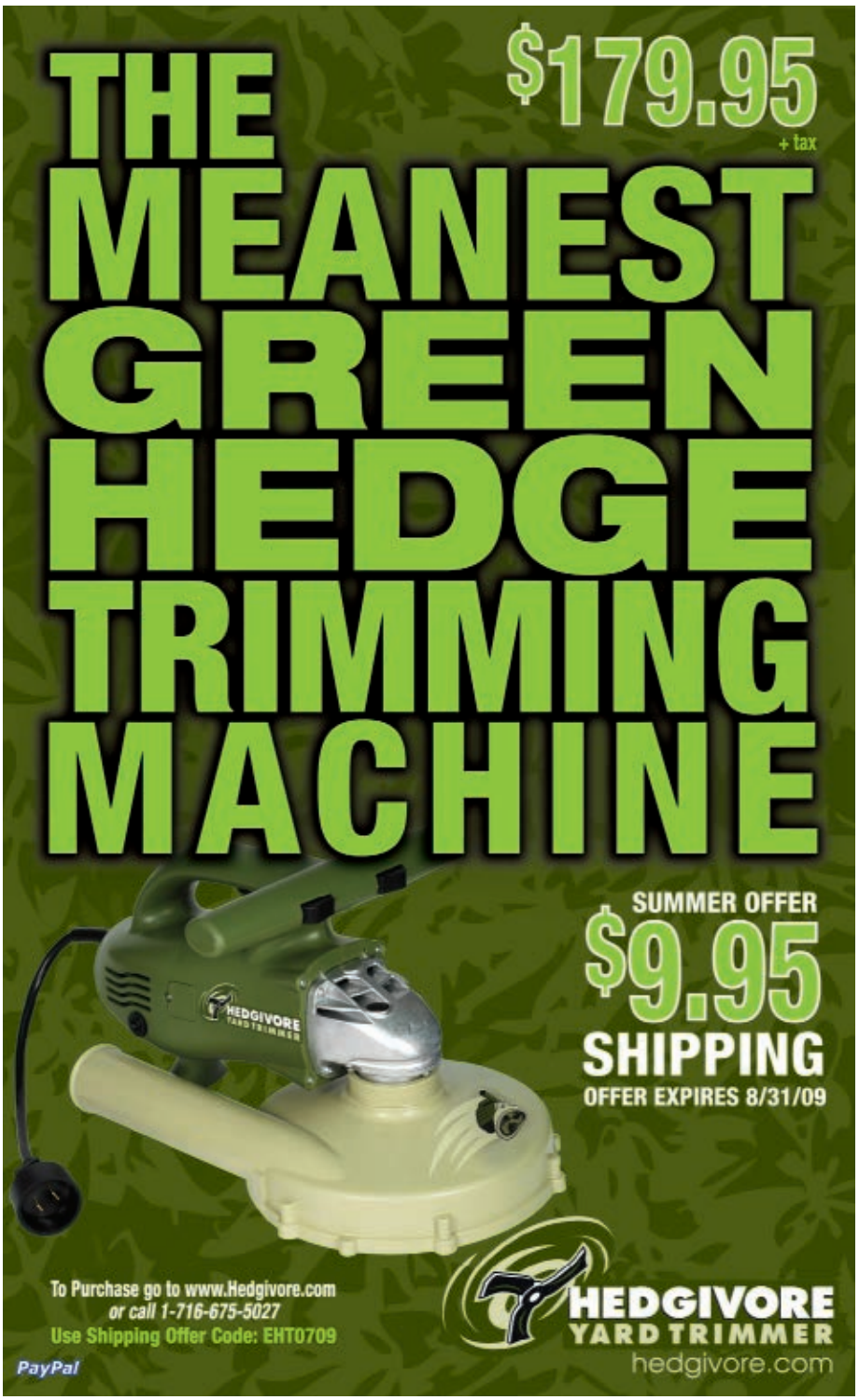
To get a solid connection to the framing and to prevent squeaks later on, I screw down the subfloor using an impact driver.

*Drill holes for pipes in the new subfloor.*

*Screw it to it—screw down the new subfloor.*

**Walls.** It's now time to frame and insulate the walls. In a typical old-house remodel, I'll reframe the walls with full 2-by-4s, but here we needed every inch, so I used what was already there—1-by strapping fastened to the block. I then insulated between the straps with rigid foam.

And for framing the shower wall I used a neat design trick, a 3/4-height shower wall. This wall not only houses the shower's plumbing and shields the room from water but—because it doesn't



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go all the way to the ceiling—light can pass over the top, giving the feeling of a much larger and accommodating space. You can even put a plant up there for color later on.

*Set the rigid foam insulation.*

## DRYWALL

There's not a ton to say about hanging drywall, but it is a watershed (pun intended) moment because once you're rockin', the room starts coming together.

*Then, hang the drywall.*

Moisture-resistant drywall is a must in the shower area—and a minimum in regard to water protection. While moisture-resistant drywall is a budget saver (and when properly detailed, works like a charm), cement backer boards have better longevity. Once the boards are hung, finish them with compound.

## FLOOR

**Underlayment.** As we build up the bathroom, the opportunities to save cash pop up often. But saving money doesn't mean low-quality work. On this bathroom we saved not only money, but days by eliminating tile. Instead, we used a vinyl sheet which worked like a charm in a small, chopped-up room like this. And, the best time to install a sheet

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is right after installing the subfloor.

A few things about sheet goods: A sheet telegraphs imperfections from the subfloor below. To minimize this, install 1/4 BC (sanded on one side) plywood to get the substrate nice and smooth. Then, use flooring mastic to fill seams and screw heads. Use the same template from the subfloor to measure and cut the underlayment.

Installation Trick: To get the subfloor and underlayment to weave in with the door jamb—no notching here–undercut the door jamb. Use a block the same thickness as your finished floor height (plus 1/8 inch for fudge factor) as a saw guide, then use a pull saw to slice through the bottom of the jamb. Once that little block from the doorjamb bottom is removed, you can tuck a strip right underneath for a seamless, notch-less look.

*"Wipe" the floor down. Use a damp rag to adhere the floor backing to the mastic and, simultaneously, wipe out any air bubbles. Work from the center out to the edges.*

**Laying Out and Installing The Sheet.** I measure the room north-south/east-west in at least three locations. Next, I layout and cut the sheet to fit within 1/2 inch all the way around. And for the third time, I use my rigid foam template to lay out the stubbed penetrations on the vinyl sheet.

It's best to unroll the vinyl on a wide, flat surface like a garage floor. However, I didn't have that,

*Trowel on glue after dry-fitting the sheet.*

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*Dry-fit the sheet before installing.*

so I made a mondo work table using my two Jawhorses, some 2-by-4s and a few sheets of plywood. This is a great trick.

I think it's a best practice to test fit the sheet in the space, carefully laying it over all penetrations before there's any glue involved. Once you know it fits, fold it in half. Next, apply glue to the subfloor. Lay the sheet back down in the glue, then, using a damp rag and some serious elbow grease, wipe/rub every square inch of the floor from the center out to the edges. This is akin to pressing a tile into thinset; it bonds the sheet to the glue and usually eliminates any air bubbles. Plus, you don't have to rent a 100-pound roller.

Repeat the process for the other half, making sure to wipe out all bubbles, then give the glue 24 hours to dry.

## PLUMBER RETURNS—SETTING FIXTURES AND "TRIM"

The bath is now ready for the plumber to return and "trim out" the bath, which means setting the fixtures and making the final plumbing connections. The plumber will also "wet bed" whatever is required. For example, the tub used here, a cast iron Kohler, is set in a mortar. This makes a bulletproof connection and delivers a solid feel to the tub. Allow 24 hours to dry.

Note: Some companies allow you to set lighter (usually fiberglass) tubs in joint compound instead of mixing up mortar. And sure, this is faster because joint compound is already mixed and

*The plumber is setting fixtures. In this case he's wiping putty on the tub drain.*

in a bucket, but mortar has more meat, and makes a more solid connection. And in the case of this Kohler, it is required.

## SHOWER WALLS

A big bridge to saving budget dollars in this bath was using fiberglass shower surround panels instead of tile. The trade-off, however, is that they require a ton of physical labor to install correctly. They need loads of caulk, which both sticks them to the wall and seals them. Sealing them tight with caulk prevents liquid and vapor from penetrating the wall system. This is a process not to be undertaken lightly or done halfway. Water vapor in the walls will cause mold and other rot issues. I like the price tag for sure, and the look is fine, but I worked hard saving these bucks.

*Use the "wiping" technique to get a solid bond between the shower surround's fiberglass panels and the adhesive on the wall.*

*I used LocTite shower surround adhesive to get a quick bond and fast dry time for the surround's fiberglass panels.*

## TRIM PACKAGE

I love trimming out bathrooms with a beadboard wainscot, primo casing, and crown where it makes sense, but for coming in under budget, spend your trim dollars in a dining room or something a little more grand. Keep it basic in the bathroom, which is what we did, using a nice but simple package. I applied base and shoe molding, which I caulked along the wall and the floor. I used a high quality caulk (Phenoseal) along the floor. It costs more than regular caulk to be sure, but it is a vinyl-based product that works well as a sealant—again, our goal is to prevent water from getting behind the walls and into the floors.

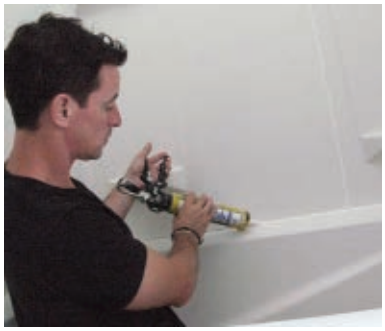
The final trim element is a custom threshold I made on the table saw. I find this faster and easier than buying a "saddle" and trying to make it fit. With the table saw I can cut my piece to the actual jobsite conditions thereby ending up with a nice transition between the existing

*One of the things that makes a bathroom deceptively difficult is the amount of infrastructure you need for such a small room. It was a tiny trim job but I had to have a full-on trim setup (read: miter saw, work table, et al) to do it right.*

*I set up my Jawhorse-based work table for detailing the vinyl floor.*

*Next step: Nail down the trim.*

*Use a high-quality caulk (like Phenoseal) to seal the shower surround and floor trim from water infiltration.*



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hallway floor and the new bathroom floor.

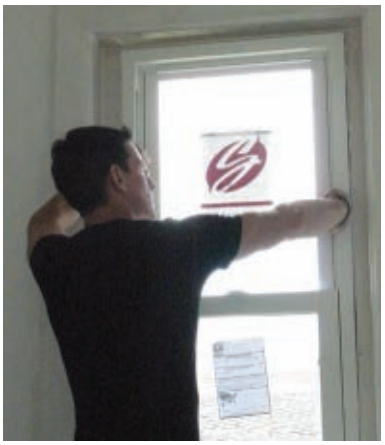
Trim Note: For cutting elements like this I use a nice blade (Freud Fusion) to really minimize blade swirls which will show up in the wood—especially if you stain or urethane it. And, I hit them with the sander before installing just to be sure they're baby-bottom smooth.

## WINDOW

I don't see how it makes a lick of sense, even on a budget, to go to all this effort and leave a drafty old window. Plus, leaving it will cost money every day it leaks conditioned air, so as an investment, I installed a new double-hung Simonton vinyl replacement unit, which was a snap to set according to manufacturer instructions. I was also able to install the unit from the inside by removing the interior blind stops and sash stops so I

*Remove the existing window sashes.*

didn't have to alter any of the exterior trim (or wrap it with metal). This meant I could seal the window tight with a bead of caulk inside and outside.



*Set the new Simonton vinyl replacement window.*

## COATINGS

Whenever possible I use low-VOC paints these days and I'm getting great performance out of Sherwin Williams products. They have low odor too, which my brain cells appreciate the day after, for sure.

It's best practice to use semi-gloss paint in a bathroom and as a budget saver, the entire room was painted semi-gloss white. This mountain of white is offset by fixtures, a colorful shower curtain and other interior design details. And while it's a lot of white, it saved hundreds on the up-front paint costs because separate colors didn't need to be cut in.

## DRYING TIME

Materials in a bathroom go in rapid fire. The joint compound is barely dry before you're setting fiberglass and caulking right over it. And there's a lot of caulk you really want to dry and cure, whether that's to make a tight grab on the fiberglass panels or the beads over the top edges and along the floor trim to keep water at bay. What's more, there's paint over the top of that and floor adhesive under the floor. And then there's mortar under the tub—which I want to dry no less than 24 hours before people stand in the tub.

If at all possible (like if there's a second bath in the home) I encourage my customers to wait a week before using the bath. If there's no other option, I encourage them not to take baths the first week

*I fastened the new, table-saw fabricated threshold.*

*Here is the Sterling DualForce toilet in its new home.*

and to limit their showers to quick ones.

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*Mark Clement is author of The Carpenter's Notebook, A Novel www.FormalFarmHouse.com.*

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# Replacing Old Aluminum Windows

**By Kathy Ziprik**

Not every window replacement job goes smoothly. That's what contractor Steve Roth discovered when hired to replace dated aluminum windows in a Michigan home.

"The windows themselves are probably 35 years old and have lost their functionality," says Roth. "The worst part is that the aluminum had oxidized over the years. The condensation that the aluminum material transfers into the interior of the house during the extremely cold Michigan winters had deteriorated the units themselves."

According to Roth, the single-paned windows were no longer serving as a barrier for exterior temperatures, so the homeowners were spending a fortune on heating bills. To solve the problem, Roth determined that energy-efficient vinyl-framed windows from Simonton Windows should be installed. The windows he specified are Energy Star-qualified for the Northern Climate Zone and feature Low-E glass with Argon gas filling.

"Quite simply, the difference is like night and day between the old aluminum windows and the new vinyl windows," says Roth. "Once we get this project finished, the energy savings will start immediately for the homeowner. And, the owners also benefit from added curb appeal and resale value thanks to the new windows.

"While the removal of the older aluminum windows was challenging, it's definitely worth it in order for the homeowners to have more energy-efficient vinyl windows installed in their home."

Before the celebrating could start over the new windows, the old ones had to come out. Tackling the project during the cold winter months gave Roth true insight into the difficulties of pulling out the existing aluminum units that had oxidized over several decades.

**Step 1:** Remove the storm windows from the exterior of the home.

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**Step 2:** From the interior, remove the aluminum window stop on one side of the unit with a reciprocating saw.

**Step 3:** Once the window stop has been removed, the sash frames can be removed from the unit.

**Step 4:** To remove the aluminum jamb from the window opening, start by using a reciprocating saw to crosscut the jamb. Be careful not to damage the interior jamb surface.

**Step 5:** After the jamb is cross cut, it can be collapsed and removed. The exterior will have an unfinished look.

**Step 6:** The remaining window area should be cleaned out, then a jamb needs to be blocked out with wood until the jamb is flush with the brick veneer.

**Step 7:** Once insulation is added to the framed opening between the sheathing and the back of the brick veneer, the new Simonton vinyl window is placed in the opening up to the blocking materials to ensure a tight fit.

**Step 8:** After ensuring that the unit is plumb and level and square in the opening, use screws to secure the window to the wooden blocking in the opening. Always refer to the manufacturer's written instructions to ensure the installation goes smoothly.

**Step 9:** For the interior, install moulding up to the window to trim out the inside of the home.

**Step 10:** On the exterior, caulk the window up to the brick veneer to ensure an airtight fit.

The newly-installed Simonton vinyl windows are a dramatic improvement over the corroded aluminum windows. The new units will help save heating and cooling costs and can now stand up much stronger to the cold Michigan winters. And, as an added bonus for the homeowners, they no longer need to hassle with maintenance issues or the use of storm windows during the winter months. **EHT**

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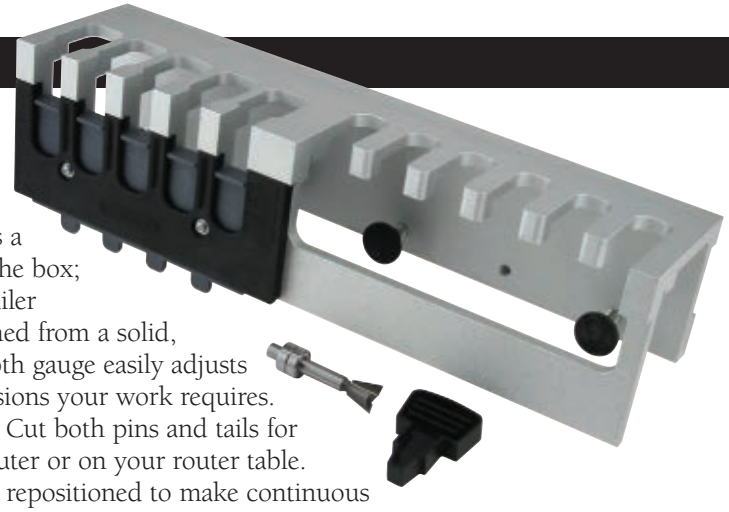

Until now, manufactured dovetail jigs were mainly for professional woodworkers and serious hobbyists due to their size, high cost and complexity. But the all-new E-Zpro DOVEtailer from General Tools & Instruments brings precision joinery capability to anyone who owns a router or router table. Make perfect joints right out of the box; no other parts or equipment are required. The DOVEtailer (Model No. 860) is a Dovetail and Box Joint Jig machined from a solid, heavy-duty aluminum extrusion. Its unique sliding depth gauge easily adjusts for routing both full and half-blind joints to the dimensions your work requires. Face-joints or box joints are just as easy to accomplish. Cut both pins and tails for dovetail or box joints in two quick passes with your router or on your router table. Setup is simple and fast, and the DOVEtailer is quickly repositioned to make continuous joints of any length using its provided alignment key. Each DOVEtailer kit includes the dovetail jig, alignment key, a 14-degree 1/4-inch-shank dovetail router bit and two guide bearings. The complete kit is available at The Home Depot for $39.97. Visit www.generaltools.com.

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# HOT PRODUCTS

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This one-worker tool straightens and holds decking boards, freeing up hands to nail or screw the boards in place, quickly and easily. This left- or right-handed tool takes only seconds to operate. Simply place one end of the BoWrench over a joist, fit the clamp snugly against the board to be aligned and pull the handle. The tool bends any size board, including 3/4-inch, 2-by-6 and more. The BoWrench binds to any 2-by (1-1/2 inch) joist, and closes gaps up to 2-1/4 inch. It has interchangeable parts for pushing or pulling boards into place. Adjustable and custom-size grippers for use on joists up to 6-1/2 inches thick are available from the factory. Gripper swivels for angled decking are also available. For more information, visit www.cepcotool.com.

## INGRAM'S GEOTHERMAL SYSTEM

Ingram's Water and Air Equipment is a geothermal system that uses the constant temperature of the earth below the frost line (about 50 degrees) to heat and cool the home year round. Commonly set up with a "well water supply system," heat can be taken from the ground during winter and transferred through a heat pump to the air in your home. Heat can also be transferred back into the ground during summer to cool your home. Since heat from the ground is free, the only electricity needed is for moving that heat between your home and the ground. According to the manufacturer, a geothermal system can lower your heating bills up to 50 percent and cooling bills up to 30 percent. Plus, due to the recent passage of the economic stimulus package, homeowners who install a geothermal system can receive a 30-percent tax credit for qualified installs with no maximum cap. To learn more or buy direct, visit www.ingramswaterandair.com.

## SHADE SAILS

Shade Sails, named for their sail-like shapes and shade-providing function, are made from tensioned fabric that can be twisted, overlapped and angled into a virtually limitless array of soaring forms. A single small sail may provide a subtle architectural accent over a household entry or window. A series of large, overlapping sails may expand over an open area like a backyard or playground. Shade Sails are available in a variety of colors and are manufactured from a high-density, UV-resistant polyethylene knit fabric. Tensioning is achieved with stainless-steel cable sewn into the perimeter of each sail and attached to existing structures or freestanding supports. When installed, the sails are taut and can resist virtually any wind condition. Learn more at www.shadesails.com.

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# HOT PRODUCTS

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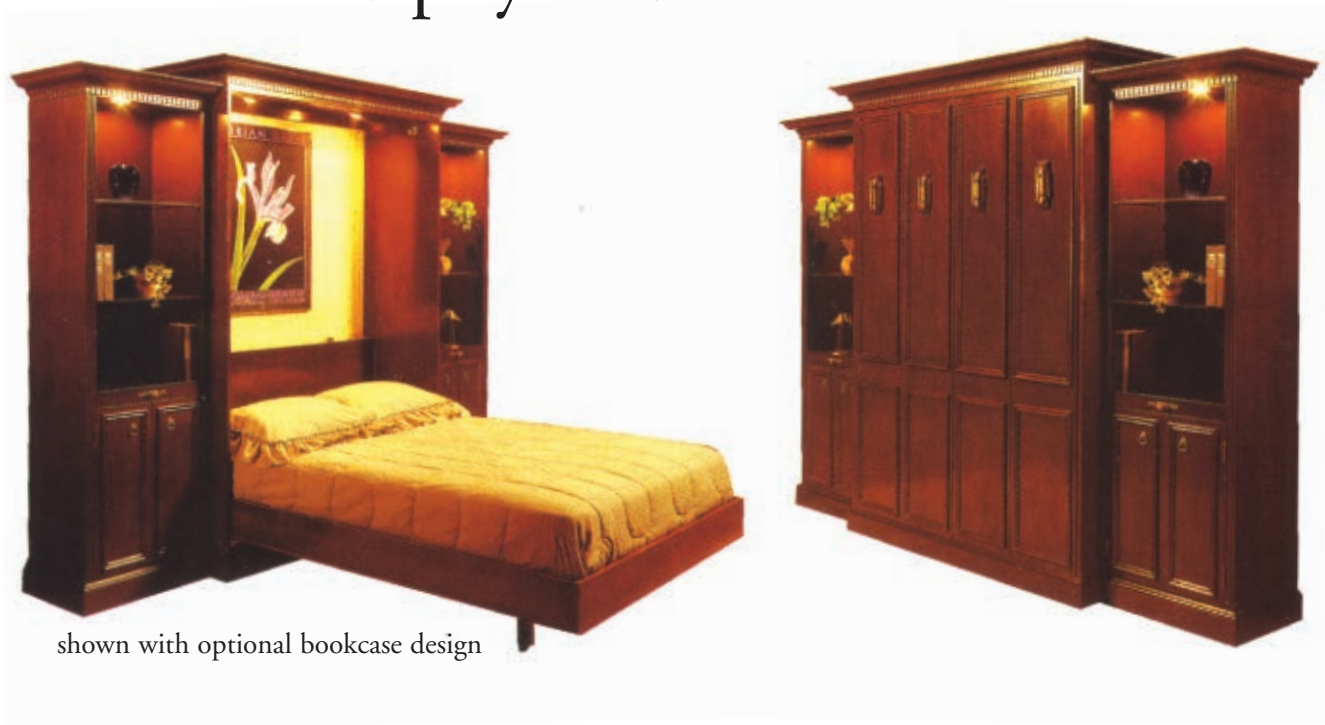

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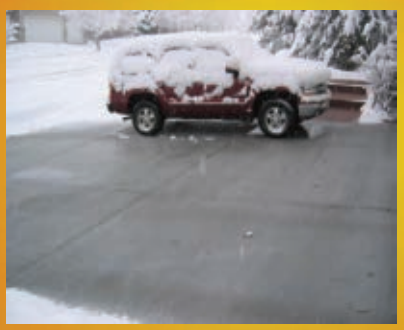

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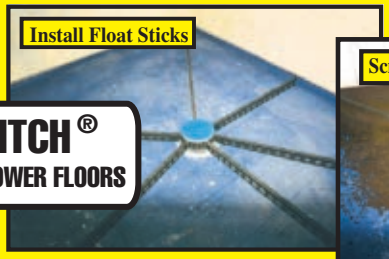

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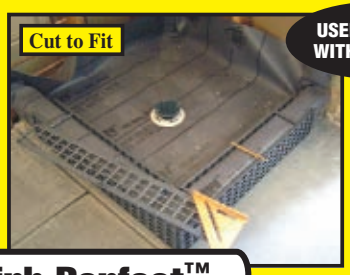


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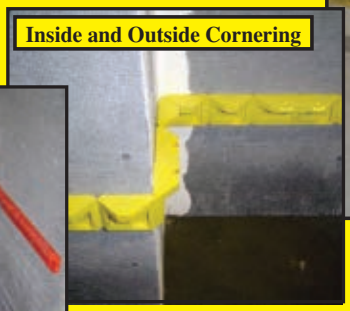

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